471

The PHOTOFACT® Servicer

SET 471 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JAN., 1960

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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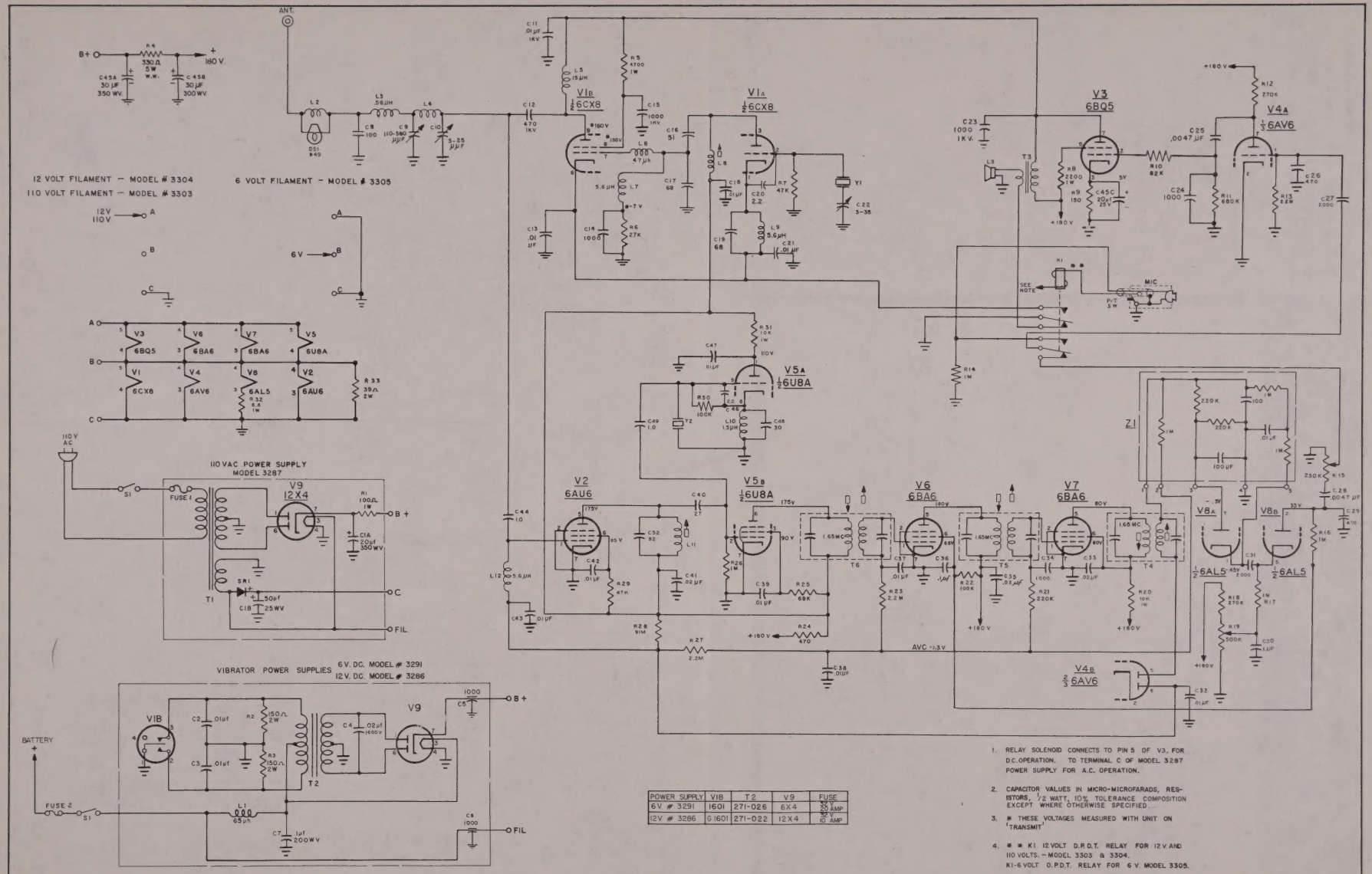
Gonset Model G-11 (3286, 3287, 3291, 3303, 3304, 3305)

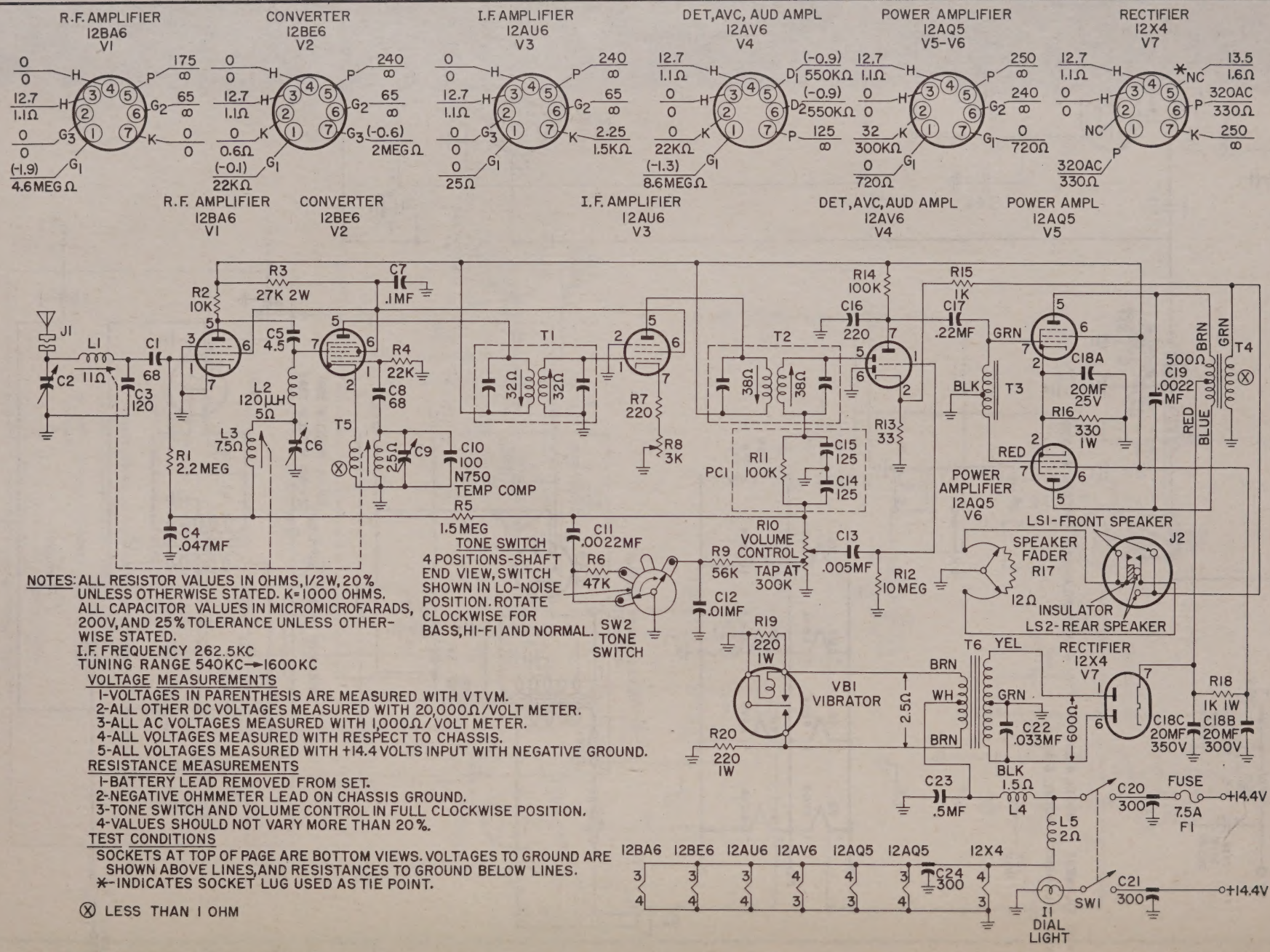
Mercury Model M-5741


12 VOLT FILAMENT – MODEL # 3304
110 VOLT FILAMENT – MODEL # 3303
6 VOLT FILAMENT – MODEL # 3305
110VAC POWER SUPPLY MODEL 3287
VIBRATOR POWER SUPPLIES 6V. DC. MODEL # 3291 12V. DC. MODEL # 3286
AVC -1.3V
1. RELAY SOLENOID CONNECTS TO PIN 5 OF V3, FOR D.C. OPERATION. TO TERMINAL C OF MODEL 3287 POWER SUPPLY FOR A.C. OPERATION.
2. CAPACITOR VALUES IN MICRO-MICROFARADS, RESISTORS, 1/2 WATT, 10% TOLERANCE COMPOSITION EXCEPT WHERE OTHERWISE SPECIFIED.
3. * THESE VOLTAGES MEASURED WITH UNIT ON 'TRANSMIT'
4. * * K1. 12 VOLT D.P.D.T. RELAY FOR 12 V AND 110 VOLTS. – MODEL 3303 & 3304. K1-6 VOLT D.P.D.T. RELAY FOR 6 V. MODEL 3305.

POWER SUPPLY	V1B	T2	V9	FUSE
6V # 3291	1601	271-026	6X4	35 V 20 AMP
12V # 3286	G1601	271-022	12X4	35 V 10 AMP

GONSET MODEL G-11 (3286, 3287, 3291, 3303, 3304, 3305)

Schematic Diagram Courtesy of Gonset Division, Young Spring & Wire Corp.



NOTES: ALL RESISTOR VALUES IN OHMS, 1/2W, 20% UNLESS OTHERWISE STATED. K=1000 OHMS. ALL CAPACITOR VALUES IN MICROMICROFARADS, 200V, AND 25% TOLERANCE UNLESS OTHERWISE STATED.

I.F. FREQUENCY 262.5KC

TUNING RANGE 540KC→1600KC

VOLTAGE MEASUREMENTS

1-VOLTAGES IN PARENTHESIS ARE MEASURED WITH VTVM.
2-ALL OTHER DC VOLTAGES MEASURED WITH 20,000Ω/VOLT METER.
3-ALL AC VOLTAGES MEASURED WITH 1,000Ω/VOLT METER.
4-ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS.
5-ALL VOLTAGES MEASURED WITH +14.4 VOLTS INPUT WITH NEGATIVE GROUND.

RESISTANCE MEASUREMENTS

1-BATTERY LEAD REMOVED FROM SET.
2-NEGATIVE OHMMETER LEAD ON CHASSIS GROUND.
3-TONE SWITCH AND VOLUME CONTROL IN FULL CLOCKWISE POSITION.
4-VALUES SHOULD NOT VARY MORE THAN 20%.

TEST CONDITIONS

SOCKETS AT TOP OF PAGE ARE BOTTOM VIEWS. VOLTAGES TO GROUND ARE SHOWN ABOVE LINES, AND RESISTANCES TO GROUND BELOW LINES.
*-INDICATES SOCKET LUG USED AS TIE POINT.

Ⓧ LESS THAN 1 OHM

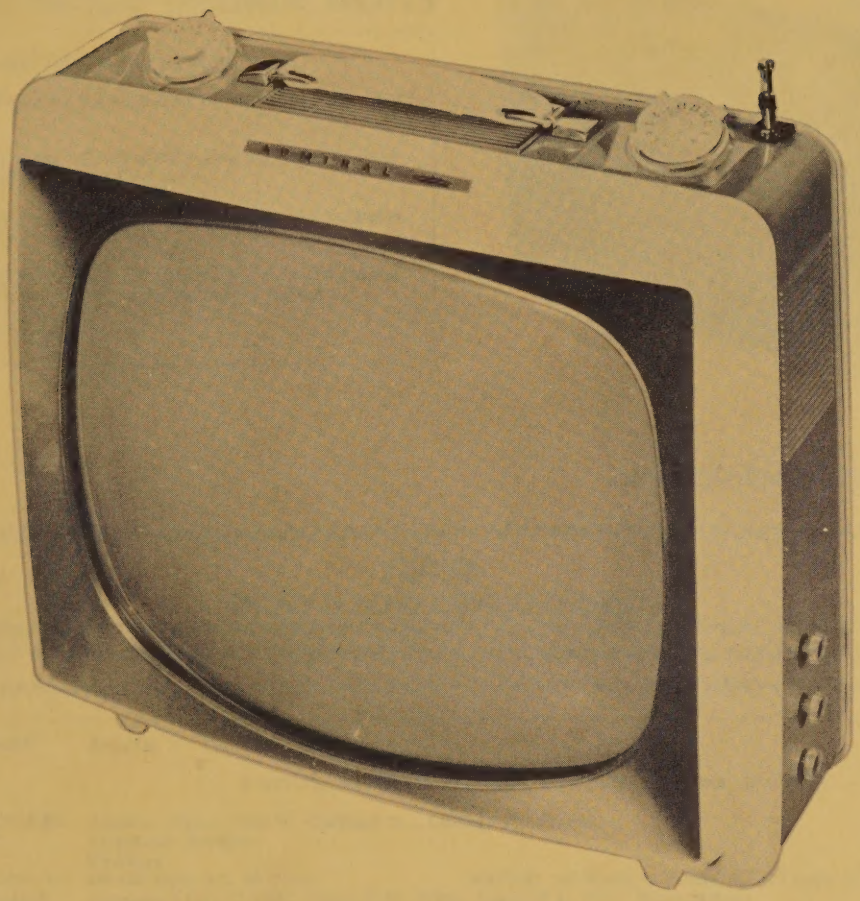
MERCURY MODEL M-5741

Schematic Diagram Courtesy of Philco Corporation

PHOTOFACT® Folder with CIRCUITRACE®

ADMIRAL MODELS PL17F31B, 32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

ADMIRAL MODELS PL17F31B,
32B, 33B, 41B, 42B, 43B (Ch. 15D1B)



MODEL PL17F31B (Ch. 15D1B)

ADMIRAL MODELS PL17F31B,
32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

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SET 471 FOLDER 1

PHOTOFACT® Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

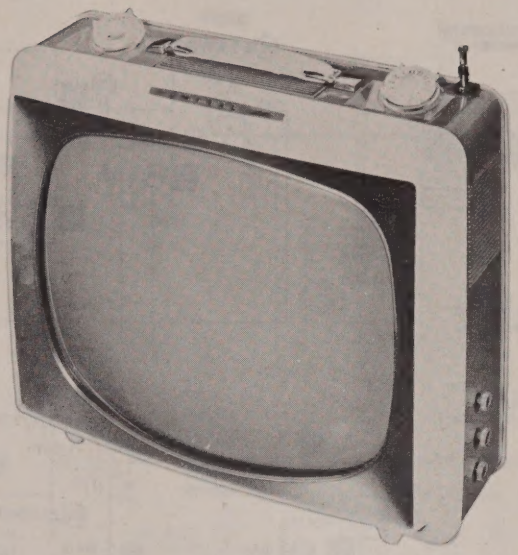
ADMIRAL MODELS PL17F31B, 32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

ADMIRAL MODELS PL17F31B, 32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL PL17F31B

1. Remove 4 push-on type knobs from top and 3 from side of cabinet.
2. Remove 7 metal screws holding rear cover. Remove antenna leads. Remove rear cover.
3. Remove speaker leads, yoke plug, picture tube socket, and HV lead.
4. Remove 4 metal screws (2 on each side) at top of chassis. Remove 3 chassis bolts from bottom of cabinet.
5. Remove chassis.



MODEL PL17F31B (Ch. 15D1B)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Admiral	MODELS	CHASSIS
		PL17F31B, PL17F32B, PL17F33B, PL17F41B, PL17F42B, PL17F43B.....	15D1B
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois		
TYPE SET	Television Receiver		
TUBES	Fourteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 145 Watts, 1.4 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 4 metal screws at top and 3 metal screws at bottom holding rear cover. Remove rear cover.
Remove 3 metal screws holding front mask at bottom.
Remove 2 metal screws, one on each side near the top, from the rear of the cabinet holding the front mask.
Pull front mask at the bottom and remove.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch-up VHF Oscillator, it is necessary to remove the Channel Selector and Fine Tuning knobs. Then remove vinyl insert being careful not to drop slip washer (on back of insert) inside chassis.

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet-Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug. (For location, see "Cabinet Rear View".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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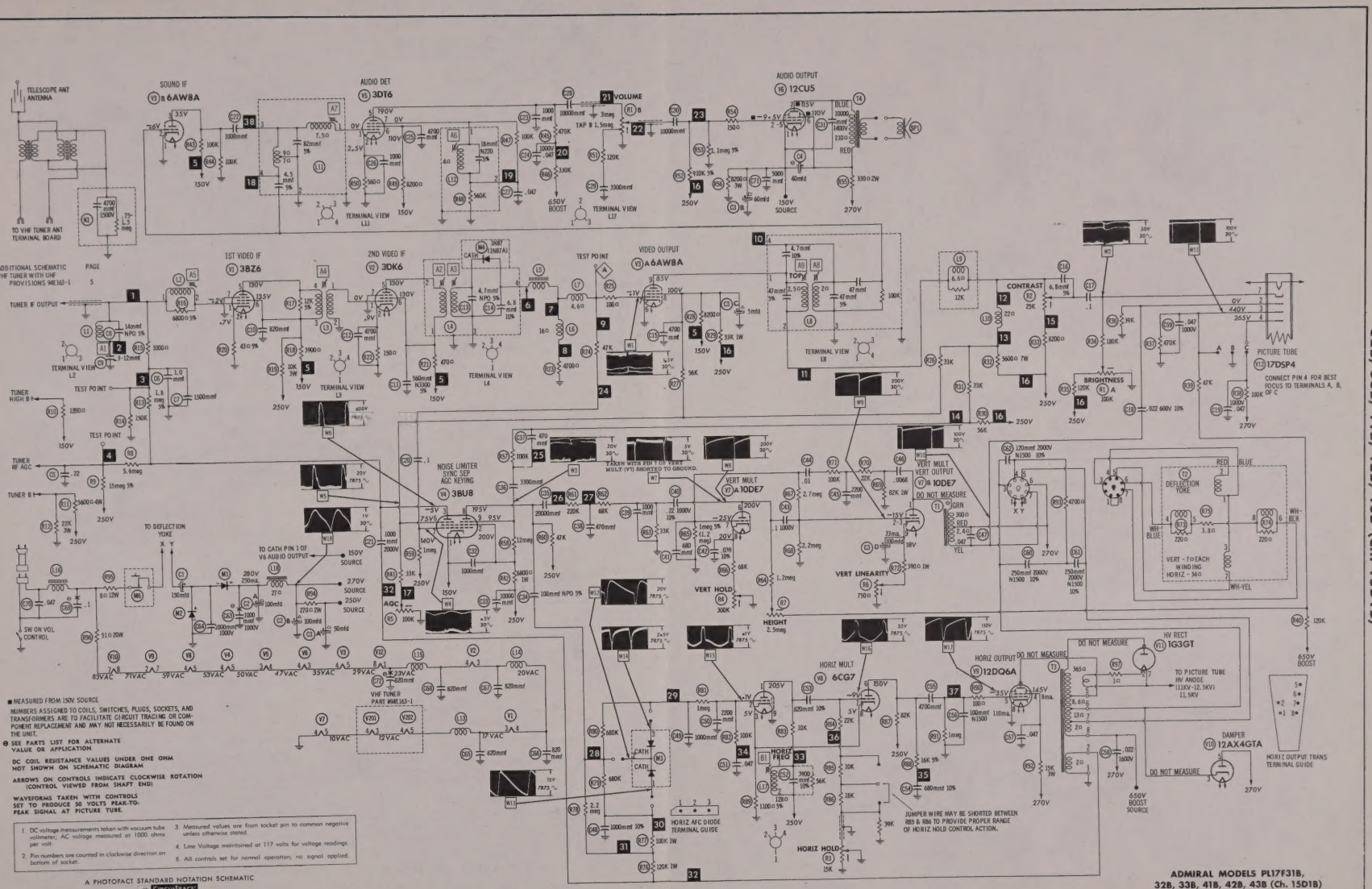
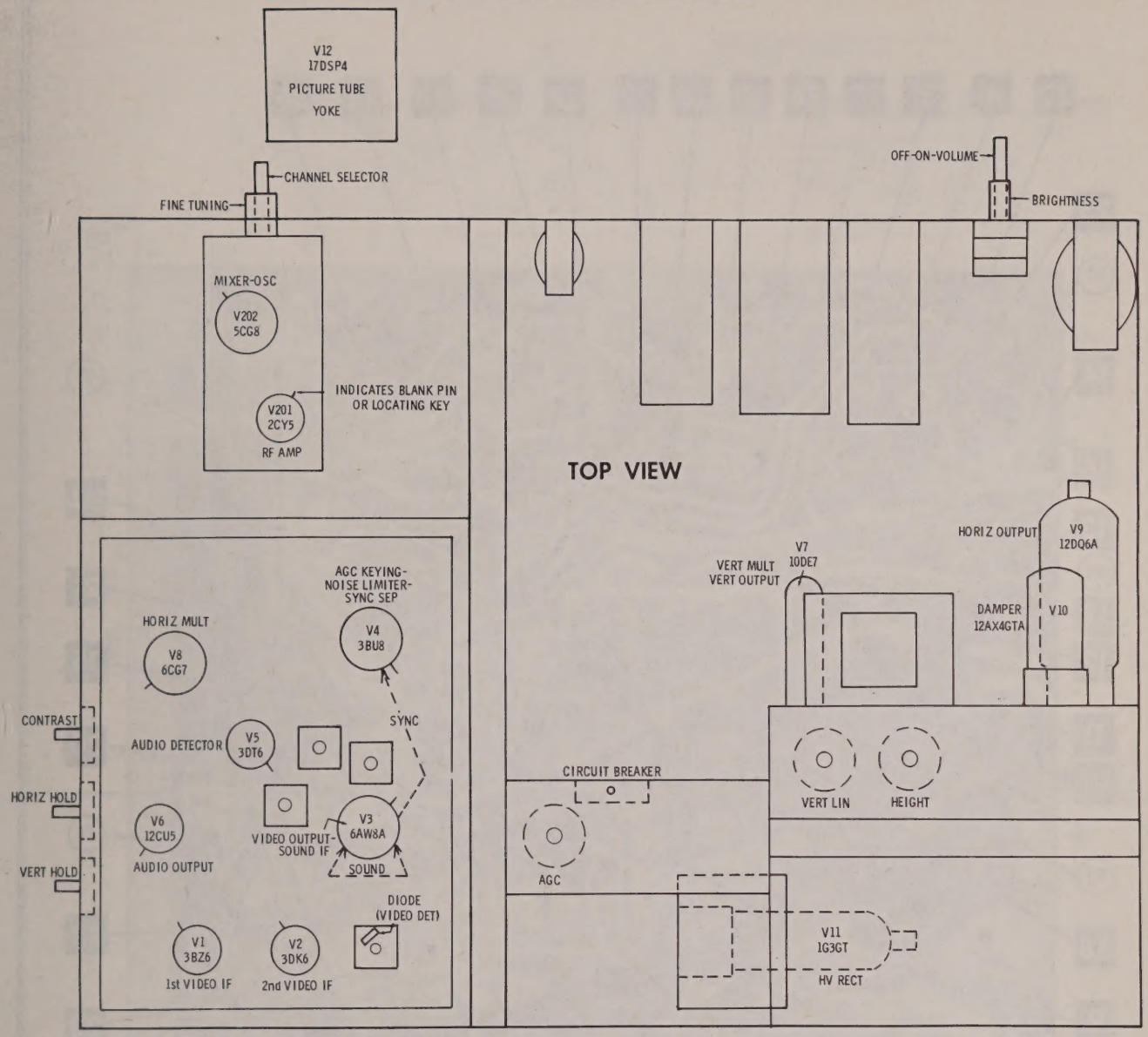

TELESCOPE ANT ANTENNA
TO VHF TUNER ANT TERMINAL BOARD
SOUND IF V3 B 6AW8A
AUDIO DET V6 3DT6
AUDIO OUTPUT V6 12CU5
21 VOLUME
TAP @ 1.5meg
TERMINAL VIEW L11
TERMINAL VIEW L17
650V BOOST
150V SOURCE
270V
250V
BLUE
RED
ADDITIONAL SCHEMATIC VHF TUNER WITH UHF PROVISIONS 94E163-1
PAGE 5
TUNER IF OUTPUT
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3DK6
1N87 (1N87A)
CATH
TEST POINT
VIDEO OUTPUT V5 6AW8A
TOP
CONTRAST
BRIGHTNESS
PICTURE TUBE V12 17DSP4
CONNECT PIN 4 FOR BEST FOCUS TO TERMINALS A, B, OR C
TERMINAL VIEW L2
TERMINAL VIEW L3
TERMINAL VIEW L4
TERMINAL VIEW L8
TUNER HIGH B
TUNER RF AGC
TUNER B
TO DEFLECTION YOKE
X Y
NOISE LIMITER SYNC SEP. AGC KEYING V4 3BU8
AGC
TO CATH PIN 1 OF V6 AUDIO OUTPUT
TAKEN WITH PIN 1 OF VERT MULT (V7) GROUNDED TO GROUND.
VERT MULT V7 A 10DE7
VERT MULT V7 B 10DE7
VERT MULT VERT OUTPUT
DO NOT MEASURE
IGRN
RED
YEL
VERT LINEARITY
VERT HOLD
HEIGHT
DEFLECTION YOKE
BLUE
WH-BLUE
WH-YEL
VERT - 7Ω EACH WINDING
HORIZ - 3.4Ω
SW ON VOL CONTROL
HORIZ MULT V8 6CG7
HORIZ OUTPUT V9 12DQ6A
HV RECT V11 1G3GT
TO PICTURE TUBE HV ANODE (11KV-12.5KV) 11.5KV
DAMPER V10 12AX4GTA
HORIZ OUTPUT TRANS TERMINAL GUIDE
HORIZ FREQ
HORIZ HOLD
HORIZ AFC DIODE TERMINAL GUIDE
JUMPER WIRE MAY BE SHORTED BETWEEN R85 & R86 TO PROVIDE PROPER RANGE OF HORIZ HOLD CONTROL ACTION.
VHF TUNER PART #ME163-1
83VAC 71VAC 59VAC 53VAC 50VAC 47VAC 35VAC 29VAC 23VAC 20VAC 10VAC 12VAC 17VAC
■ MEASURED FROM 150V SOURCE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE
©Howard W. Sams & Co., Inc. 1960
ADMIRAL MODELS PL17F31B, 32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

TUBE PLACEMENT CHART



ADMIRAL MODELS PL17F31B,
32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

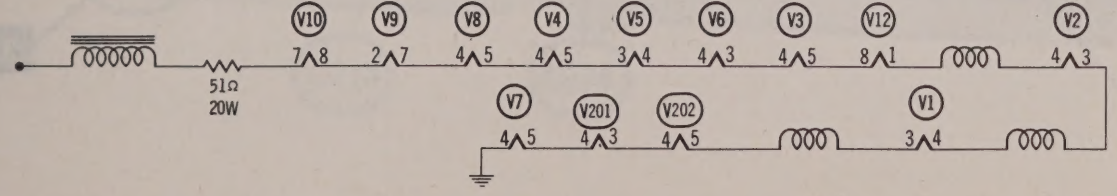
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, Rect. (B+)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, Rect. (B+)
Vert. off freq. V7
Horiz. off freq. Diode (Horiz. AFC), V8

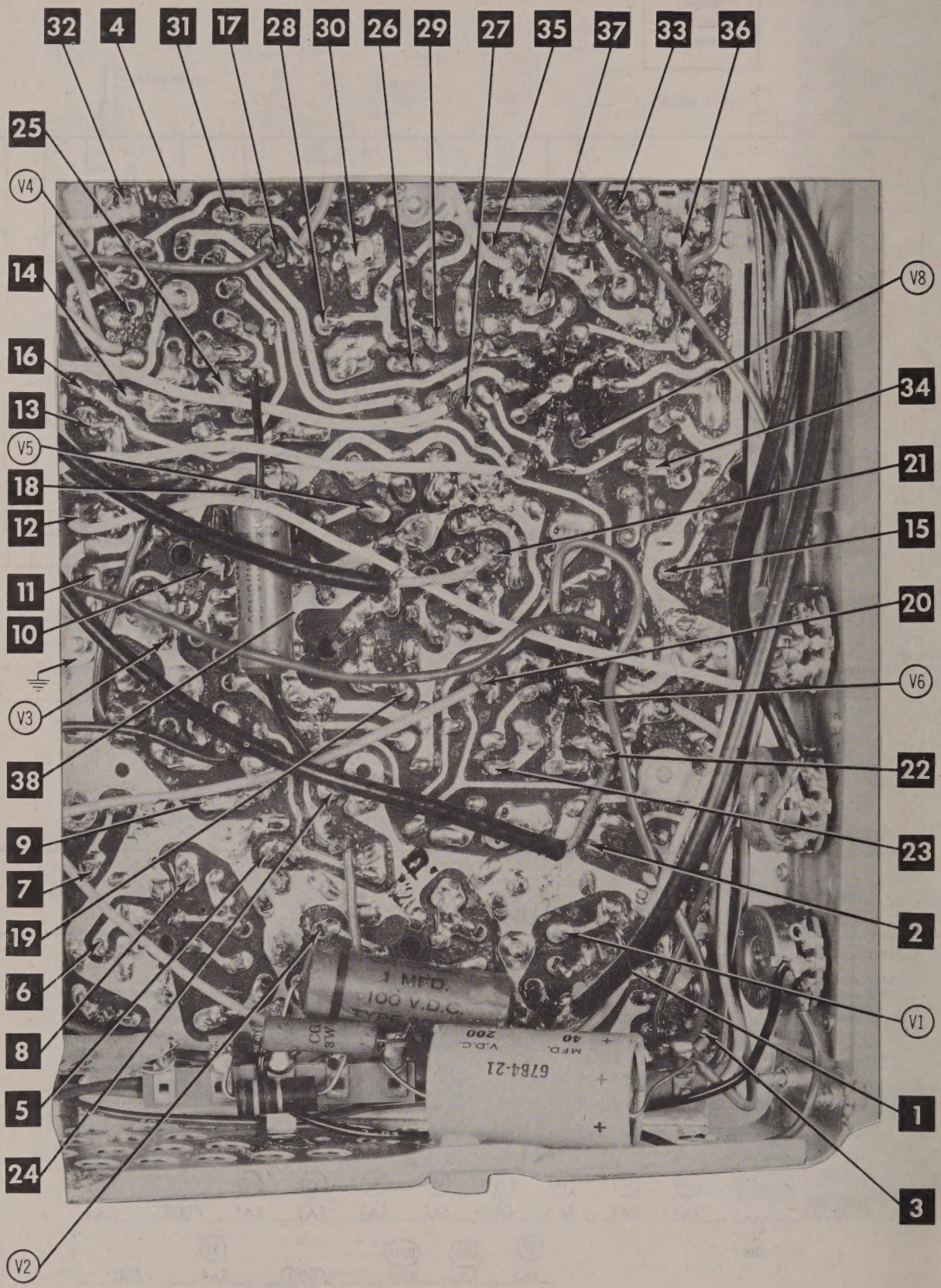
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V3, V5, V6
Overloaded picture V4

SYNC FAILURE
No vert. sync V4
No horiz. sync V4, Diode (AFC)
No vert. or horiz. sync V4

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



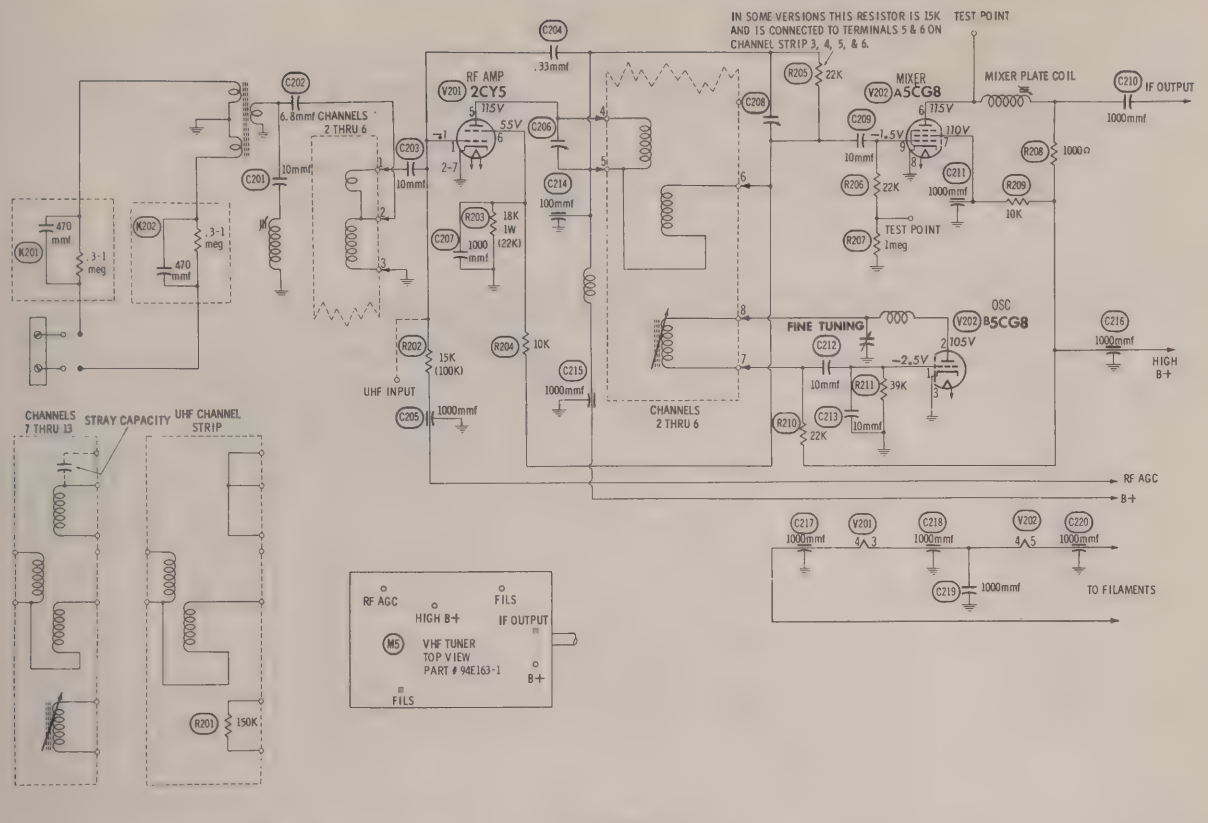
FOLDER 1



A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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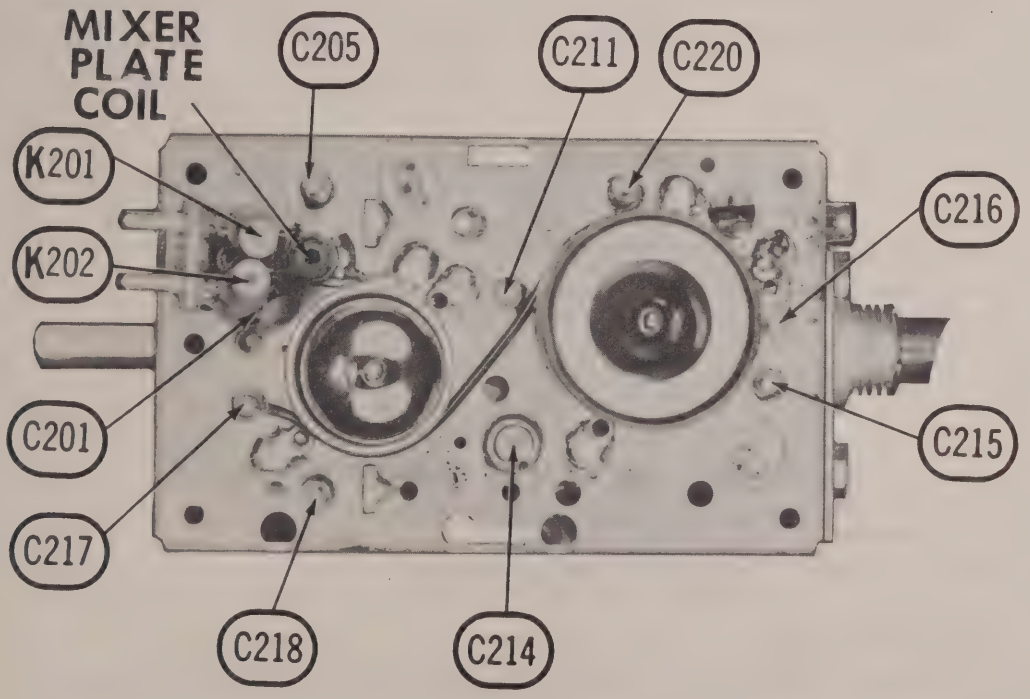
VHF TUNER with UHF provisions 94E163-1



TUNER - TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

94E163-1

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	2CY5

ITEM No.	USE	TYPE
V202	Mixer-Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C202	6.8		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C203	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C204	.33							
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206								
C207	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C208								
C209	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C210	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C211	1000		EF-001	MFT-1000		CCF-102	CT280A	
C212	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C213	10		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C214	100			MFT-100				
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	
C216	1000		EF-001	MFT-1000		CCF-102	CT280A	
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	150K	
R202	15K	(100K) *
R203	18K 1W	(22K) *
R204	10K	

ITEM No.	RATING	REMARKS
R205	22K	Note 1
R206	22K	
R207	1meg	
R208	1000Ω	

ITEM No.	RATING	REMARKS
R209	10K	
R210	22K	
R211	39K	

* Alternate Value

Note 1. In some versions this resistor is 15K and connects to terminals 5 and 6 on channel strips 3, 4, 5 and 6.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf, .3-1meg	63B10-4	Centralab RC-471 Sprague AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	63B10-4	Centralab RC-471 Sprague AC1-1

TUNER ALIGNMENT INSTRUCTIONS

TUNER ALIGNMENT

Suggested alignment tools: GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

VHF OSCILLATOR ALIGNMENT

The individual channel adjustment screws are accessible one at a time, thru a hole in the front of the tuner, as the channel selector is rotated. Turn the fine tuning so that slug is visable thru hole. Switch to channel to be adjusted and adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

This portion of the tuner has been properly aligned at the factory and is very stable. Alignment of this portion should not be attempted in the field.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools:

A1	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A2 thru A9..	GENERAL CEMENT #8282, 8606, 8606L, 9295 WALSCO #2526, 2543, 2544, 2545
Mixer Plate Coil	GENERAL CEMENT #9296, 9297 WALSCO #2546, 2547

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication on VTVM.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side to ungrounded tube shield floating over Mixer-Osc. (V202). Low side to chassis.	Not used	47.25MC (Unmod)	Any non-interfering channel	USE VTVM DC probe thru 47K to point (A). Common to chassis. (Across Video Det. load)	A1	Adjust for MINIMUM deflection.
2.	"	"	44.2MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	42.7MC	"	"	A3	"
4.	"	"	44.3MC	"	"	A4	"
5.	"	"	42.7MC	"	"	A5	"
6.	"	"	44.8MC	"	"	Mixer Plate Coil	"
7.	"	44.0MC (10MC Swp)	42.25MC 45.75MC	"	Vert. Amp. thru 47K to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch SLIGHTLY A2 thru A5 and Mixer Plate Coil for desired response.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust controls for normal operation.
Turn A6 slowly counterclockwise until a buzz is heard in the sound. Turn counterclockwise for maximum undistorted sound. Reduce the signal at the antenna terminals (by use of an adjustable attenuator or disconnecting antenna) until a strong hiss similar to super-regeneration is heard in the sound.
Carefully adjust A7 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears during alignment, further reduce signal until hiss returns and retouch A7.
Carefully adjust A8 for MINIMUM 4.5MC beat interference in picture.
Carefully adjust A9 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears, further reduce signal until hiss returns and retouch A9.

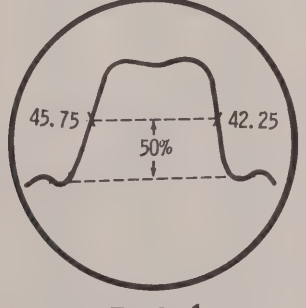


FIG. 1

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	CBS / GENERAL ELECTRIC / RAYTHEON / SYLVANIA — USE	TYPE
V1	1st Video IF Amp.	3BZ6
V2	2nd Video IF Amp.	3DK6
V3	Video Output-Sound IF Amp.	6AW8A
V4	AGC Keying-Noise Limiter-Sync Sep.	3BU8
V5	Audio Detector	3DT6
V6	Audio Output	12CU5
V7	Vert. Mult. - Vert. Output	10DR7
V8	Horiz. Mult.	6CG7
V9	Horiz. Output	12DQ6A
V10	Damper	12AX4GTA
V11	HV Rect.	1G3GT

PICTURE TUBE

ITEM No	REPLACEMENT DATA: ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V12	17DSP4					

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	150	200	67D15-324	AFH8-37-25	XA0315	FP131	TM5-34	TVL-1540	
C2A	▲100	350	67D15-321	AFH2-41-50	BG332	FP327.7	TMT-165	TVL-3641	
B	▲100	350							
C3A	▲50	350	67D15-323	AFH84-56-05	D0473	FP430.29	TMQ-140	TVL-4635	
B	●60	200							
C	▲5	200							
D	100	50							
C4	40	200	67B4-▲	PRS1580	BR4025	TC58	TD-50-250	TVA-1511	Note 1

Note 1. Alternate Part #67A25-2.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.22 200V		P388N-22		CUB3P22	2DP-4-224	GEM-2032	2TM-P22
C6	1.0 100V		P388N-1.0		CUB3W1		GEM-21	2TM-M1
C7	1500		BPD-0015	DD-152	BYA10D15	CCD-152	GP215	5HK-D15
C8	14 NPO ▲%			DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C9	3-12							
C10	820		DZ-820	DD-821	BYA30T82	CCD-821	GP383	10TS-T82
C11	560 N3300 5%	#65DA0-159				CCD-4700	GP247	5HK-D47
C12	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	5HK-D47
C13	4.7 NPO 5%		NPO-DZ 4.7	DTZ-4R7	C10Y47C	CCTO-4R7	CNO-547	10TCC-Y47
C14	6.8 10%		NPO-SI 6.8	TCZ-6R8	C10Y68C	CCTO-6R8	CNO-568	10TCC-Y68
C15	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	5HK-D47
C16	6.8 5%		NPO-SI 6.8	TCZ-6R8	C10Y68C	CCTO-6R8	CNO-547	10TCC-Y68
C17	.1 600V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-601	4TM-P1
C18	.022 500V 10%		Y84C8322-10%		PM6S22	6DP-2-223	GEM-1622	6TM-S22
C19	.047 1000V		P1088N-047		CUB10S47	16DP-3-443	GEM-10147	10TM-S47
C20	.1 600V		P488N-1	DF-104	CUB4P1	CUB4P1	GEM-601	4TM-P1
C21	1000 2000V		BVD-30-1000	DD30-102	HVB20D1	VCM-25-102M	2EV-210	30GA-D10
C22	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C23	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C24	.047 1000V		P1088N-047		CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C25	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	5HK-D47
C26	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C27	.047 300V		P2S1N-047	DD-503	BC3S47J	4DP-3-473	ACE5147	3SF-S47
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C29	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C31	10000 1400V		DAC-377	DDE-103	BVE10S1	16DP-3-103	UAC-110	BL-S10
C32	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C33	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C34	100 NPO 5%		NPO-DZ 100	DTZ-100	C10T1C	CCTO-101	CNO-310	10TCC-T10
C35	20000		BPD-02	DD-203	BYB6S3	CCD-203	GP120	5HK-S20
C36	3300		BPD-0033	DD-332	BYA10D33	CCD-332	GP233	5HK-D33
C37	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C38	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C39	1000		BPD-001	DD-102	BYA10D1	CCD-471	GP210	5HK-D10
C40	22 1000V 10%							
C41	680		BPD-00068	DD-681	BYA10T68	CCD-681	GP368	10TS-T68
C43	.039 600V 10%		P584CM-039		PM6S4	6DP-3-393	GEM-1614	6TM-S4
C43	.1 1000V		P1084CM-1		CUB10P1			10TM-P1
C44	.01 600V		P488N-01	DE-103	CUB6S1	6DP-3-103	GEM-611	6TM-S1
C45	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C46	.0068 600V		P488N-0068	DE-682	CUB8D68	6DP-1-682	GEM-6268	6TM-D68
C47	.047 600V		P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C48	1000 10%		DL-1000	DD-102	1RS1N	CCD-102	GP210	10TS-D10
C49	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C50	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C51	.047 200V		P2S1N-047	DD-503	BC3S47J	4DP-3-473	ACE5147	2TM-S47
C52	3900 10%		1464-0039		1RSD39	CM-20B-392K	MCJ462.5	MS-239
C53	820 10%		1469-00082	DD-821	1RST82	CM-20B-821K	MCB251	MS-382
C54	680 10%		1469-00068	DD-681	1RST68	CM-20B-681K	MCJ249	MS-268
C55	4700		BPD-0047	DD-472	BYA10D47M	CCD-470	GP247	5HK-D47
C56	100 N1500			TCL-100				
C57	.047 500V		P488N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C58	.022 1500V		P1684CM-023		CUB16S22	16DP-4-223	GEM-1612	MD-S22
C59	.047 1000V		P1088N-047	DD-503	CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C60	250 2000V N1500 10%	#65DA0-304						
C61	250 2000V N1500 10%	#65DA0-304						
C62	120 2000V N1500 10%	#65DA0-148						
C63	1000 1000V	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C64	1000 1000V		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C65	820		DL-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C66	820		DL-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C67	820		DL-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C68	820		DL-820	DD-821	BYA10T82	CCD-821	GP382	10TS-T82
C69	.1 600V	Note 1	P488N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1

FIXED CAPACITORS (cont)

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C70	047 600V		P588N-047	DD-503	CUB6S47	6DP-3-403	GEM-6147	6TM-S47
C71	5000		BPD-005	DD-502	BYA10D5	CCD-502	GP250	5HK-D50
C72	820	Note 1	DL-820	DD-821	BYA10T82	CCD-821	GP383	10TS-T82

▲ Admiral Part Number. Note 1. Not used in some versions.
● Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100K	½	75B1-35	F1-31	RTV-690			Brightness
B	3meg	½		R3-80				Volume, Tap ② 1.5meg
C	Switch			KB-1				Power Off-On
R2A	25K	½	75D20-123	AB-26	A47-25K	Q11-120	D29	Contrast
B	Shaft			AK-6	R3-3/16	NQ	D6-37	
R3A	15K	½	75D20-130	AB-19	A47-15K-S		TA15L	Horiz. Hold
B	Shaft			AK-8	R3-3/16		D6-37	
R4A	300K	½	75D20-120	AB-30	A47-300K-S	Q11-131	D48	Vert. Hold
B	Shaft			AK-5	R3-3/16	NQ	D6-37	
R5A	100K	½	75D20-118	AB-36	B47-100K-S	B17-128	PTA15L	AGC
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R6A	750Ω	½	75D20-124	AB-5	B47-750-S	B11-105	PTA75L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R7A	2.5meg	½	75D20-123	BK-33	B47-2.5meg-S	B11-239	BU-S95	Height
B	Shaft			Not Req.	Not Req.	TM4	Not Req.	

† "Concentrikit" Equivalent: K-3 Kit with Base Elements & Shafts: B11-126, P1-103 (Panel) B18-140X, R1-122 (Rear) 78-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise stated.

ITEM No.	RATING	REMARKS
R8	5.6meg	
R9	15meg 5%	
R10	1200Ω	
R11	5600Ω 4W	
R12	22K 3W	
R13	1.8meg 5%	
R14	150K	
R15	1000Ω	
R16	6800Ω 5%	
R17	12K 5%	
R18	3900Ω	
R19	10K 3W	
R20	43Ω 5%	
R21	470Ω	
R22	150Ω	
R23	4700Ω	
R24	47K	
R25	100Ω	
R26	33K	
R27	56K	
R28	8200Ω	
R29	33K 1W	
R30	56K	
R31	33K	
R32	5600Ω 7W	
R33	8200Ω	
R34	180K	
R35	120K	
R36	39K	
R37	470K	
R38	100K	
R39	47K	
R40	120K	
R41	33K	
R42	6800Ω 1W	
R43	100K	
R44	100K	
R45	470K	
R46	330K	
R47	100K	
R48	560K	
R49	8200Ω	
R50	560Ω	
R51	120K	
R52	910K 5%	
R53	1.1meg 5%	
R54	150Ω	
R55	330Ω 2W	
R56	8200Ω 3W	
R57	100K	
R58	1meg	
R59	1meg	
R60	47K	
R61	220K	
R62	68K	
R63	33K	
R64	1.2meg	
R65	1meg 5%	(1.2meg)*
R66	68K	
R67	2.7meg	
R68	2.2meg	
R69	82K 1W	
R70	22K	
R71	100K	
R72	390Ω 1W	
R73	220Ω	
R74	220Ω	
R75	3.6Ω COLD	#61A27
R76	180K 1W	
R77	100K 1W	
R78	2.2meg	
R79	680K	
R80	680K	
R81	1meg	
R82	100K	
R83	10K	
R84	22K	
R85	10K	
R86	18K	
R87	82K	
R88	16K 5%	
R89	1100Ω 5%	
R90	100Ω	
R91	1meg	
R92	15K 3W	
R93	4700Ω	
R94	270Ω 2W	
R95	6Ω 13W	#61B1-49
R96	51Ω 20W	#61B3-34
R97	1Ω	

▲ Admiral Part Number. * Alternate value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA
X1	Antenna Isolation	470mmf ① 1500V, .75-1.5meg	65B10-3	Centralab RC-490 Sprague ACL-4

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap Coil	73B31-3	19-1001	19-1001	BC-562	6804		
L2	1st Video IF	72C332-41						
L3	2nd Video IF	72C132-42						
L4	3rd Video IF	72B207-2						
L5	RF Choke	73B31-4						
L6	Shunt Peaking Coil	73B5-20	19-3500	19-3500	TV-203	6174	VP-8	500uh
L7	Resonant Choke	73B31-3						280uh
L8A	Sound Take-Off	73C185-5						
B	4.5MC Trap							①
L9	Series Peaking Coil	73B5-39						879uh
L10	Shunt Peaking Coil	73B5-34			TV-207	6186		
L11A	2nd Sound IF	72B308-1						Tap ② 70
B	Phase Shift Coil							
L12	Quadrature Coil	72B132-37						
L13	Fil. Choke							
L14	Fil. Choke							
L15	Fil. Choke							
L16	Line Choke	73B31-1						68uh

① Includes 12K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI	SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L17	128Ω		94D17-14						Horiz. Stabilizer

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT 1000 ^(½)	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L18	.350A	27Ω	1.25 Hy.	74C18-33	26C44				26C44	C-33X

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	Vert. Output	79C43-20			V319				A-140X
	Alt. Vert. Output	79B43-20			V319				A-140X
T2	Yoke-Horiz. (18.8MH) (110°-Vert. (14.2MH)	94D150-7	Y-52 1▲2		Y-110 1 2 3		DY-27A 1 2 3	Y-52 1 2	A-60 & NW-23 2
	Rear Cover & Centering Device	94C186-1							
T3	Horiz. Output	79D83-2							D-171

1. Requires new rear cover and centering device.
2. Connect same as original.
① Use original yoke damping network if necessary.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	2400Ω	3-4Ω	79D33-28	24S53	A-3025	AU-804	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP	REPLACEMENT DATA: ADMIRAL PART No.	QUAM PART No.	NOTES
SP1	3" x 5"	PM	3-4Ω	78C158-1	3A05	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ADMIRAL PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.250A	93B12 *	BD-500 *	RA504 *	40K *	SR500 *	* Silicon Type
M2	.250A	93B12 *	BD-500 *	RA504 *	40K *	SR500 *	* Dual Selenium Type
M3		93B5-8 *		IG616 *			

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ADMIRAL PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M4	1N87 *	1N87	1N90	1N295	1N295	Video Det. (Pigtail

* Alternate type 1N87A.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M5	Tuner	94E163-1	VHF
M6	Circuit Breaker Antenna	84B17-4 89C238-1	JFD Replacement Part #TA370

CABINETS & CABINET PARTS

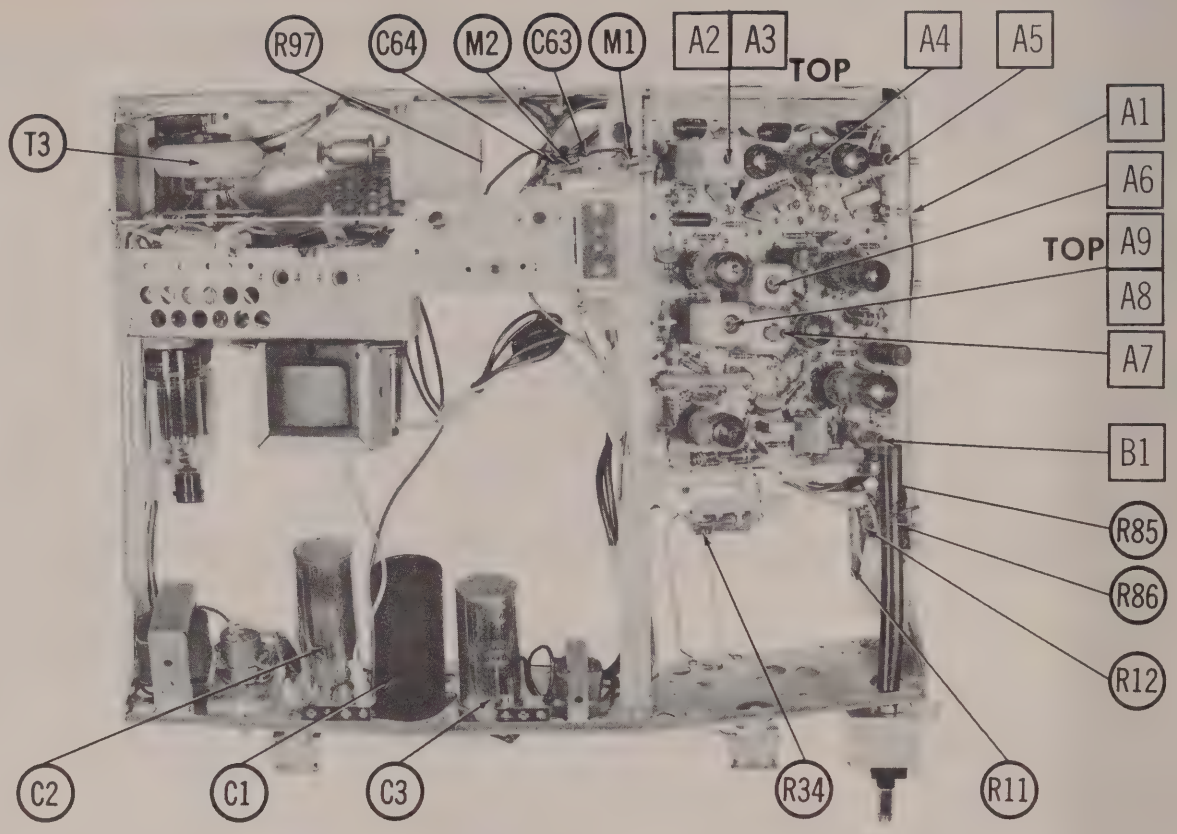
When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

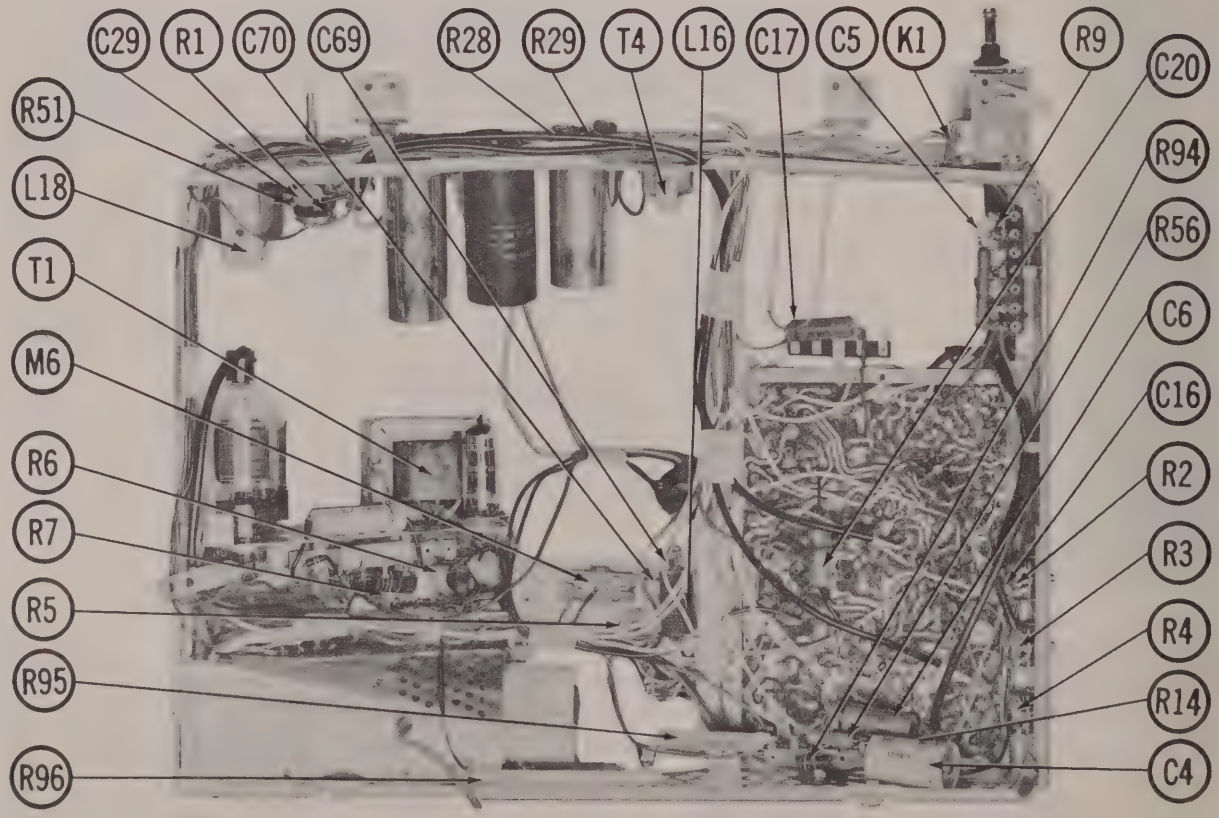
High Voltage Lead	Use BELDEN No. 8859
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8235
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8375
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8495 (Round) - 5 Conductor 8498 (Round) - 8 Conductor

ADMIRAL MODELS PLI7F31B, 32B, 33B, 41B, 42B, 43B (Ch. 15D1B)

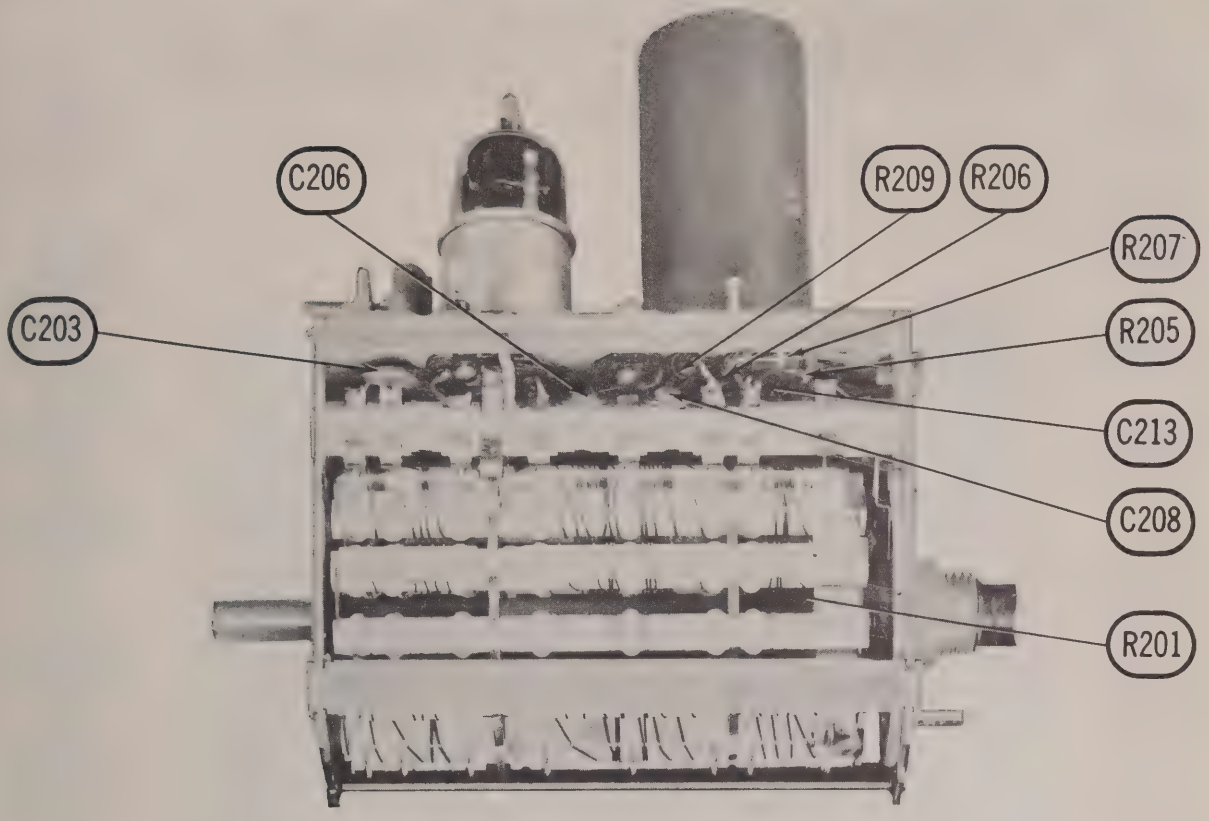
FOLDER 1



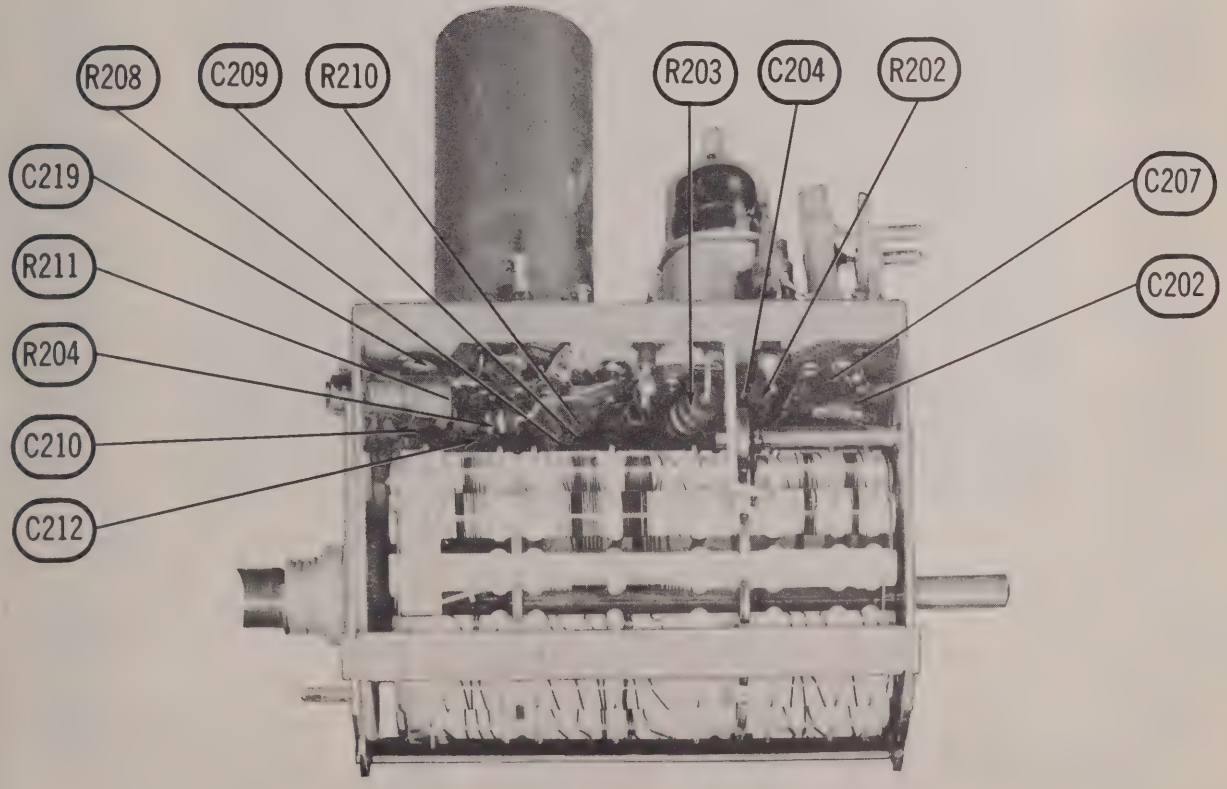
CHASSIS - REAR VIEW



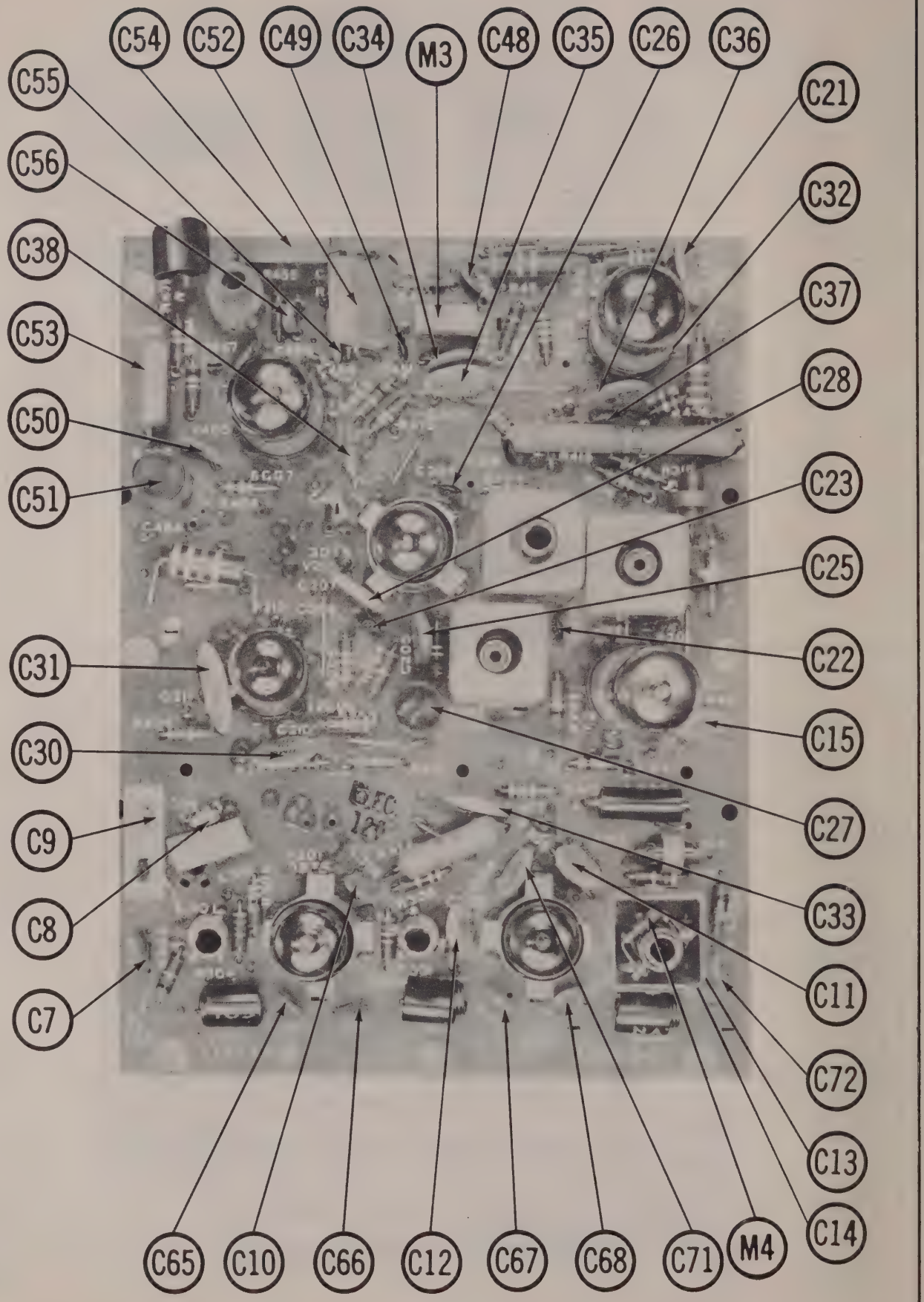
CHASSIS - FRONT VIEW



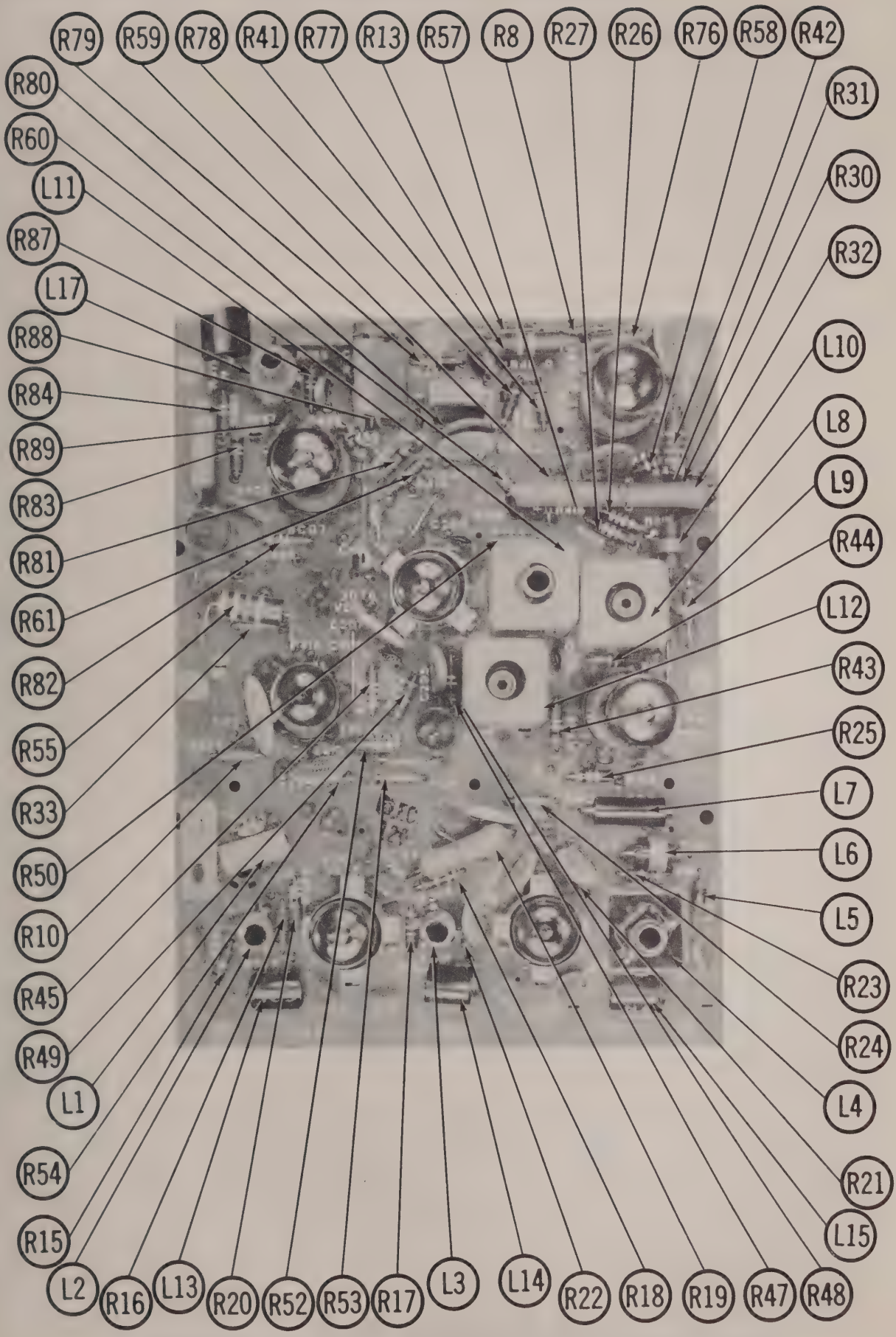
TUNER - LEFT SIDE



TUNER - RIGHT SIDE



PRINTED BOARD - CAPACITOR & MISC. IDENT.



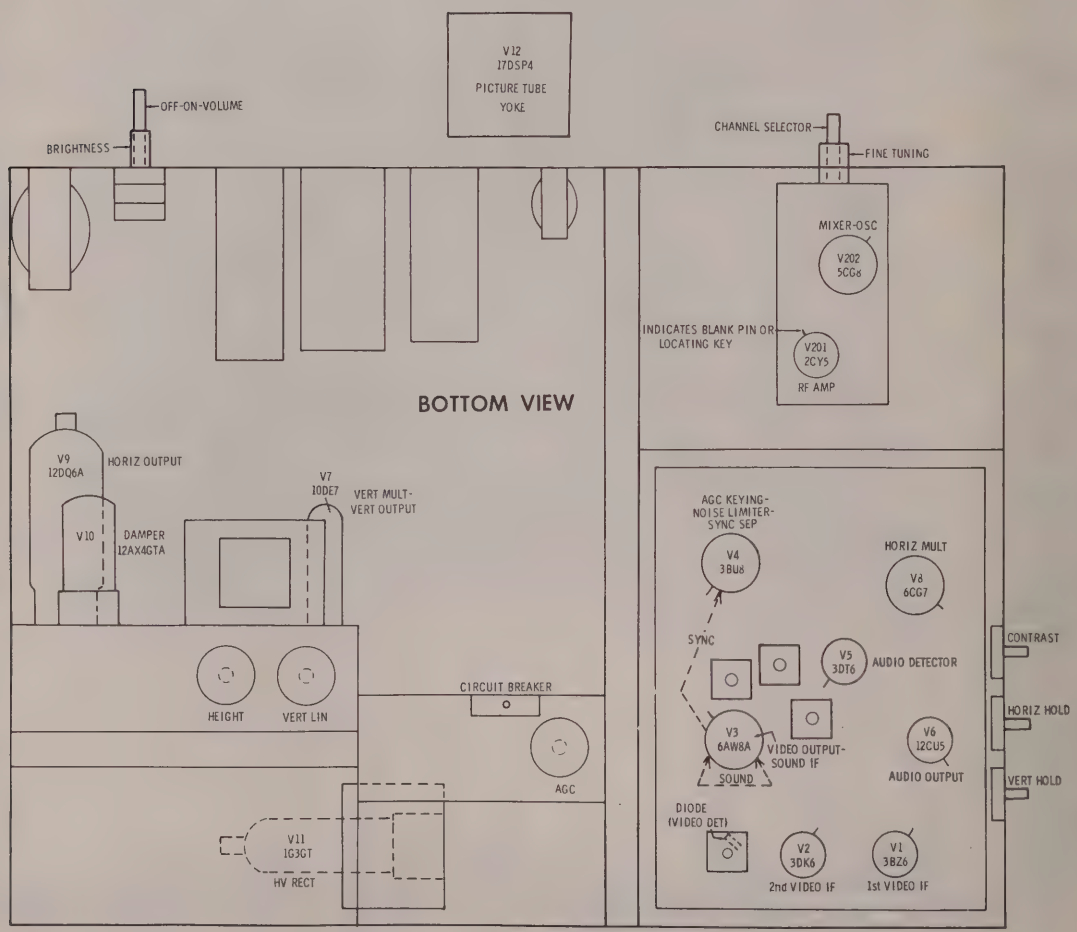
PRINTED BOARD - RESISTOR & INDUCTOR IDENT.

RESISTANCE MEASUREMENTS

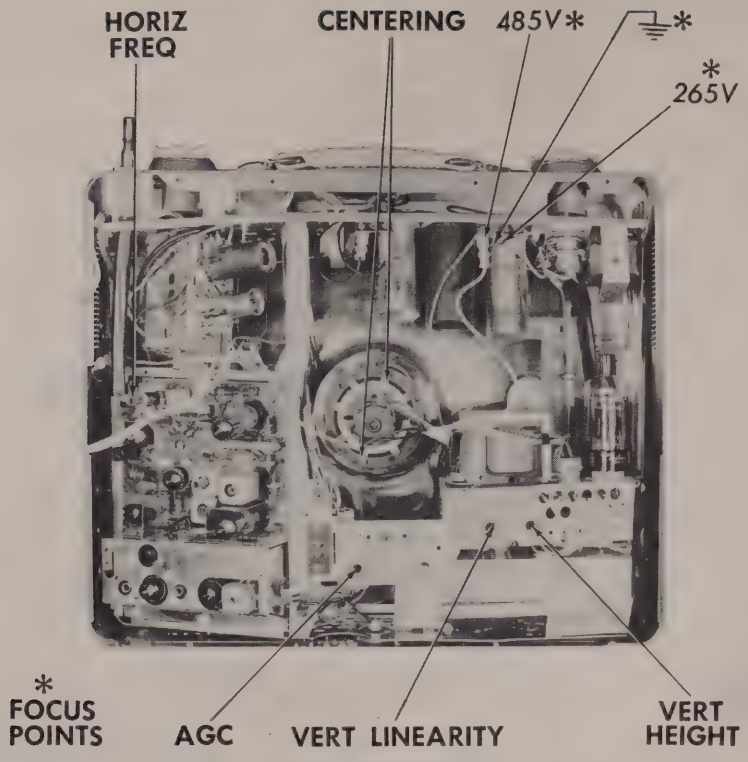
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	150K	43Ω	4.5Ω	5Ω	▪ 3300Ω	▪ 3300Ω	0Ω		
V2	3DK6	.1Ω	150Ω	5Ω	5.5Ω	▪ 470Ω	▪ 470Ω	0Ω		
V3	6AW8A	0Ω	100K	▪50K	9Ω	7.5Ω	0Ω	4800Ω	▪6500Ω	†4800Ω
V4	3BU8	▪ 0Ω	†6800Ω	1.9meg	14Ω	13Ω	†20K	†1meg	†47K	†12meg
V5	3DT6	16.5Ω	560Ω	13Ω	12Ω	ǂ800K	▪8200Ω	560K		
V6	12CU5	¶	600K	9Ω	12Ω	600K	†330Ω	†540Ω		
V7	10DE7	†300Ω	1.5meg	1.5meg	0Ω	2.5Ω	●ǂ1.5meg	1meg	●190K	●600Ω
V8	6CG7	†10K	2.5meg	1100Ω	15.5Ω	14Ω	†82K	●55K	1100Ω	0Ω
V9	12DQ6A	NC	18Ω	NC	†15K	1meg	TP	15.5Ω	0Ω	TOP CAP ǂ8.6Ω
V10	12AX4GTA	NC	NC	¶500K	NC	†0Ω	NC	18Ω	21Ω	
V11	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †373Ω
V12	17DSP4	5.5Ω	39K	ǂ170K	†100K	NC	NC	●210K	7.5Ω	
V201	2CY5	5.5meg	0Ω	3Ω	2.5Ω	†480Ω	†12K	0Ω		
V202	5CG8	39K	▪ 23K	0Ω	3Ω	4.5Ω	▪ 2200Ω	▪11K	0Ω	1meg
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM 150V SOURCE.
† MEASURED FROM 270V SOURCE.
ǂ MEASURED FROM PIN 3 OF V10.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



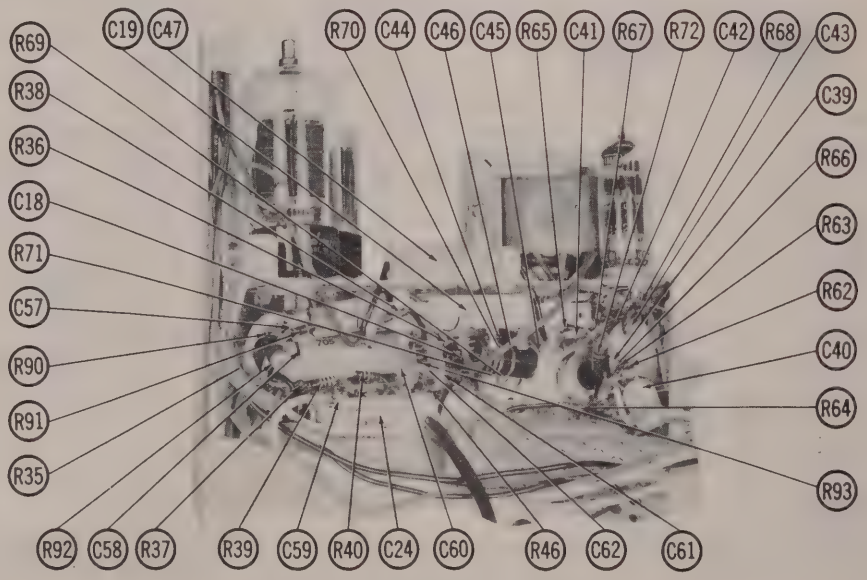
CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold to the center of its range.

Tune in a TV station and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Proper adjustment is indicated when it is possible to switch from one channel to another without the picture losing sync.



SWEEP CHASSIS

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SETCHELL-CARLSON
MODELS T60, 60C (Ch. 259)

SETCHELL-CARLSON
MODELS T60, 60C (Ch. 259)

SETCHELL-CARLSON
MODELS T60, 60C (Ch. 259)

MODEL T60 (Ch. 259)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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SET 471 FOLDER 2

PHOTOFACT® Folder

SETCHELL-CARLSON
MODELS T60, 60C (Ch. 259)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type knobs from front of cabinet.
2. Remove 8 wood screws holding rear cover. Remove the rear cover.
3. Remove picture tube socket, HV lead, yoke plug, speaker plug and antenna terminal strip.
4. Remove 2 chassis mounting wood screws at rear of the chassis.
5. Remove chassis.

PICTURE TUBE REMOVAL

1. Remove 3 screws holding trim strip at bottom edge of the safety glass. Tilt glass out and remove.
2. Remove front mask.
3. Remove 8 wood screws holding rear cover. Remove the rear cover.
4. Remove HV lead, yoke plug and picture tube socket.
5. Remove 4 picture tube mounting strap bolts.
6. Remove picture tube.

MODEL T60 (Ch. 259)

TRADE NAME	Setchell-Carlson MODELS T60, 60C (Ch. 259)
MANUFACTURER	Setchell-Carlson Inc., New Brighton, Minn.
TYPE SET	Television Receiver
TUBES	Sixteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 125 Watts, 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 3 screws holding the trim strip at the bottom edge of the safety glass. Tilt glass out and remove.

FUSE

One fuse is used for low voltage power supply protection. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, remove Channel Selector and Fine Tuning knobs.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A10) located on top of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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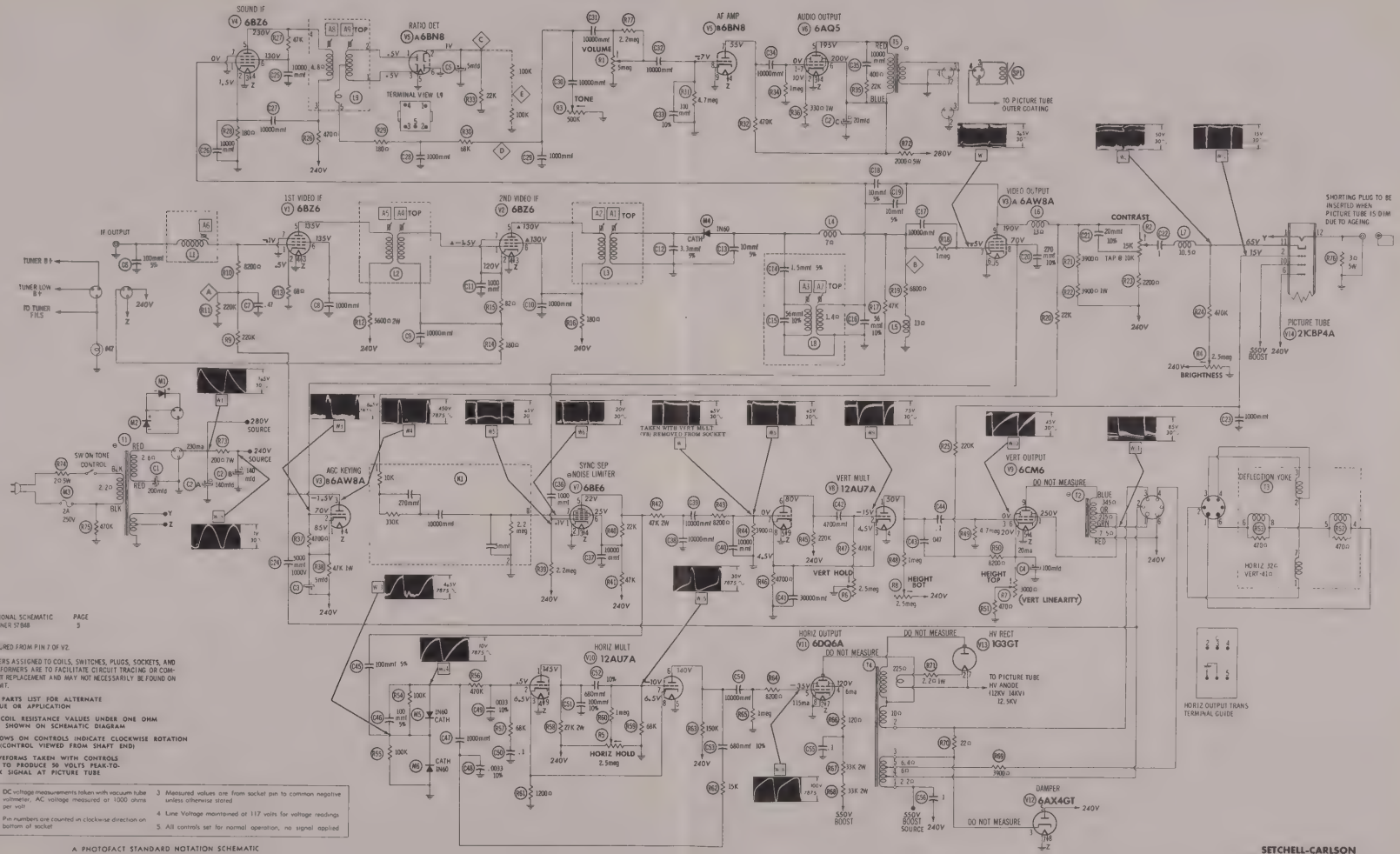
JA691

SET 471 FOLDER 2



ADDITIONAL SCHEMATIC PAGE
VHF TUNER 57B48 5

▲ MEASURED FROM PIN 7 OF V2.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE

1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt

2 Pin numbers are counted in clockwise direction on bottom of socket

3 Measured values are from socket pin to common negative unless otherwise stated

4 Line Voltage maintained at 117 volts for voltage readings

5 All controls set for normal operation, no signal applied

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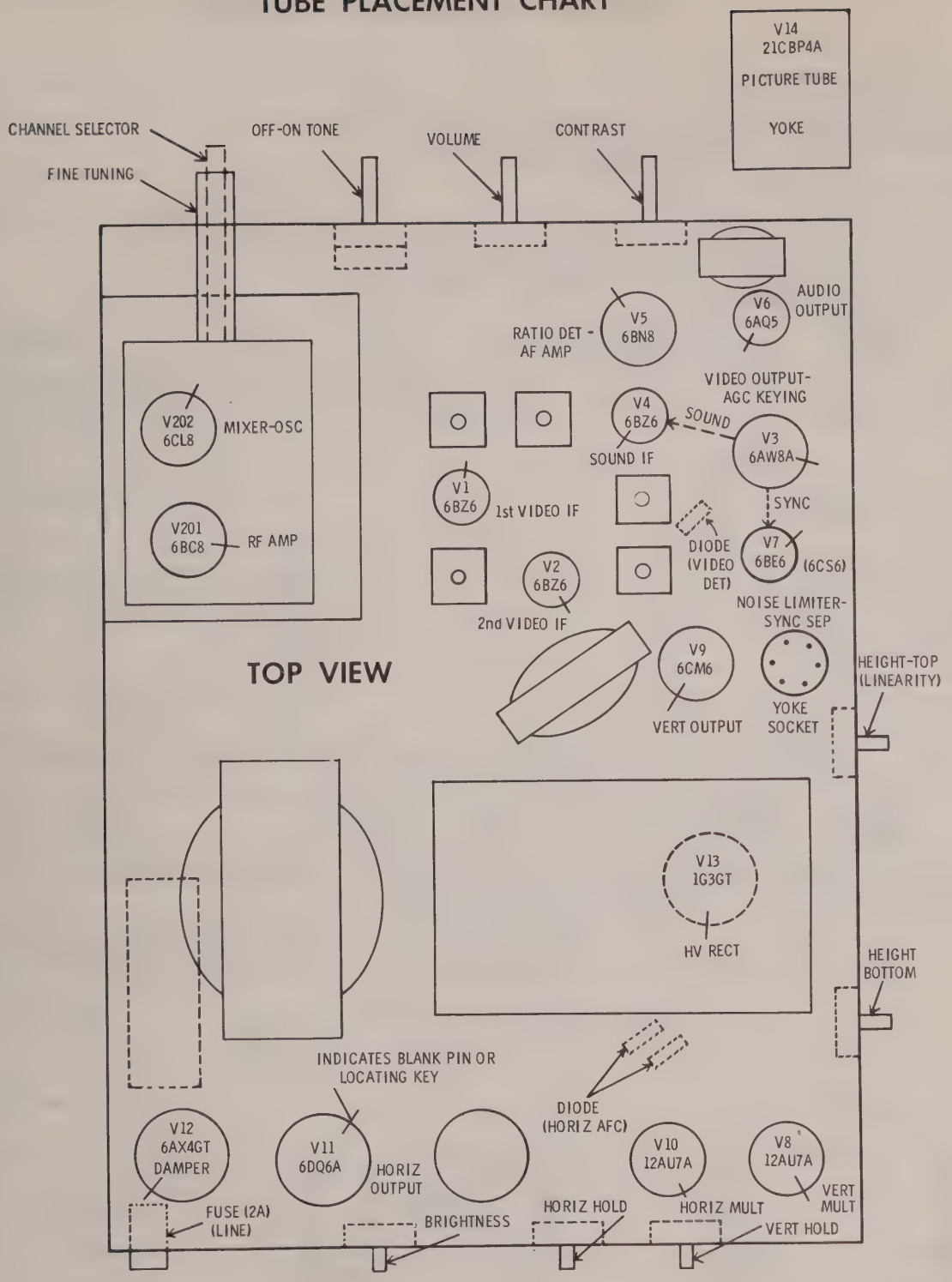
SETCHELL-CARLSON
MODELS T60, 60C (Ch. 259)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound — Fuse (LV Power), Rect. (B+)

SWEEP FAILURE
No raster, has sound — V10, V11, V12, V13, V14
No vertical deflection — V8, V9
Poor vert. linearity or foldover — V8, V9
Poor horiz. linearity or foldover — V10, V11, V12
Narrow picture — V10, V11, V12, Rect. (B+)
Vert. off freq. — V8
Horiz. off freq. — Diode (Horiz. AFC), V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster — V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow — V201, V202
No pic, has sound, has raster — V3, V14
Has pic, no sound — V4, V5, V6
Overloaded picture — V3

SYNC FAILURE
No vert. sync — V7
No horiz. sync — Diode (AFC), V7
No vert. or horiz. sync — V7

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect the negative lead of a 6 volt bias supply to point Ⓐ. Positive to chassis.
Use 10MC sweep unless otherwise noted.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .01mfd to pin 1 (grid) of 2nd Video IF. Low side to chassis.	44.0MC	41.25MC 45.75MC	Any non-interfering channel.	Vert. amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2, A3	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 and A2 controls shape of curve. A3 places 41.25MC marker in trap notch.
2.	High side thru .01mfd to pin 1 (grid) of 1st Video IF. Low side to chassis.	"	"	"	"	A4, A5	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
3.	Place a thin insulated metal strip between the Mixer-Osc. tube(V202) and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	"	"	"	A6 and Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. If necessary, retouch A4 and A5 for proper tilt.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point Ⓒ to chassis. The junction of these two resistors is alignment point Ⓔ as shown on the schematic.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .001 mfd to point Ⓑ. Low side to chassis.	4.5MC (Unmod.)	Any non-interfering channel	DC probe thru 100K to point Ⓒ. Common to chassis.	A8	Adjust for maximum deflection.
5.	"	"	"	DC probe to point Ⓓ. Common to point Ⓔ.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6

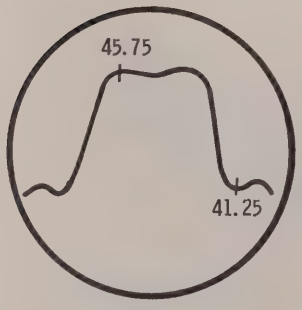


FIG. 1

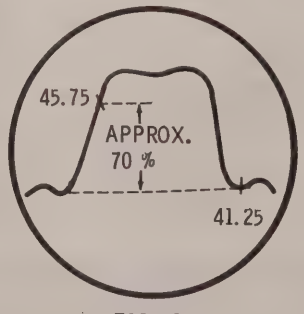


FIG. 2

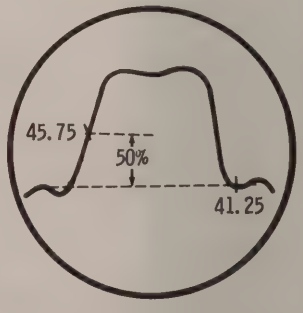
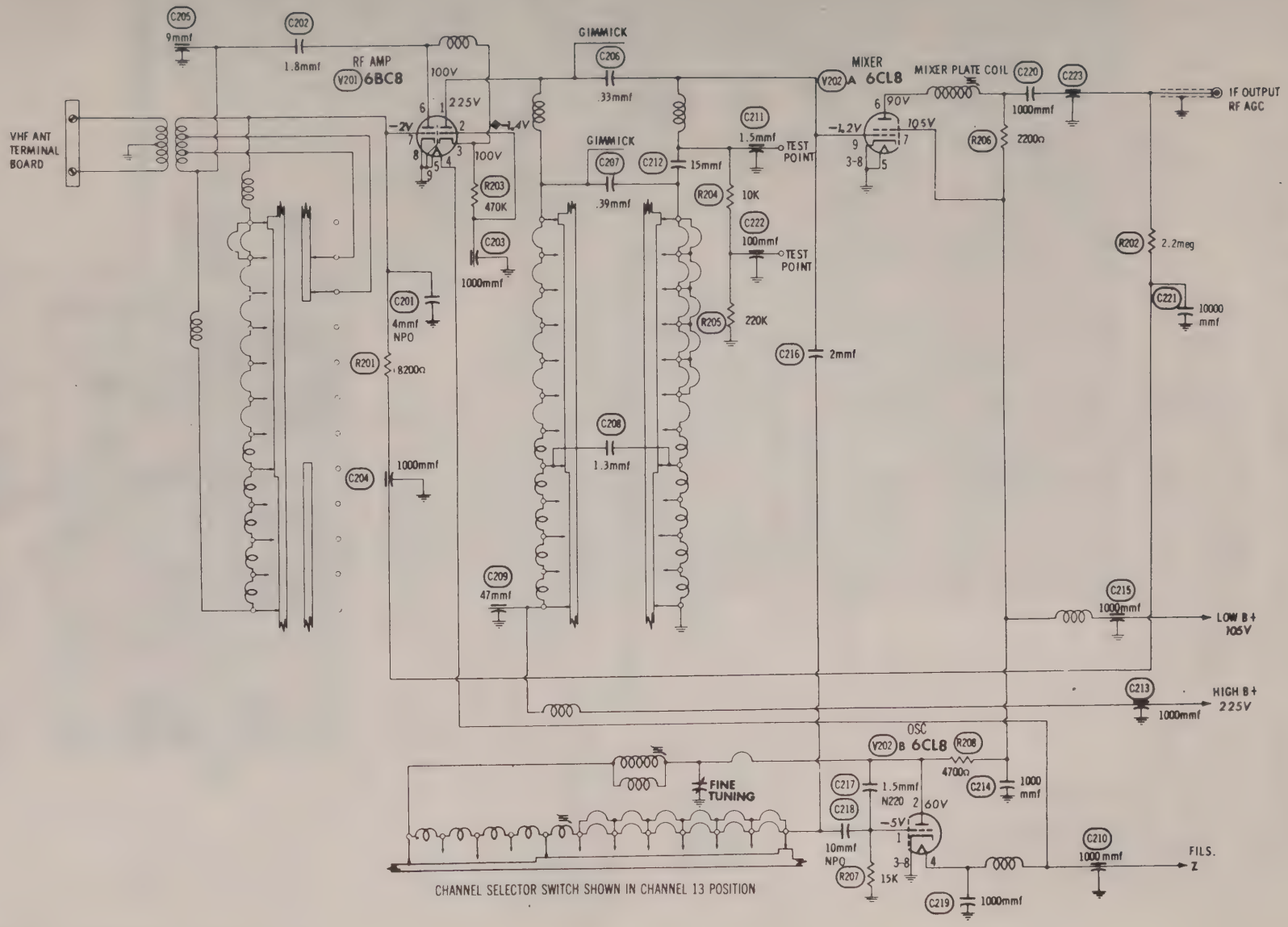


FIG. 3



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VHF TUNER #57B48

SETCHELL-CARLSON MODELS 160, 60C (Ch. 259)

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •		• RAYTHEON •	SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	6BC8	V202	Mixer-Osc.	6CL8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	4 NPO				C10V4C			10TCC-V39
C202	1.8				C10V2C			10TCC-V18
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205	9		NPO-DI 10	DTZ-10	C10V9C	CCTO-100	CNO-410	10TCC-Q10
C206	.33							
C207	.39							
C208	1.3		NPO-DI 1.5	DTZ-1.5	C10V15C		CNO-515	10TCC-V12
C209	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C210	1000		EF-001	MFT-1000		CCF-102	CT280A	
C211	1.5		NPO-DI 1.5	DTZ-1.5	C10V15C		CNO-515	10TCC-V15
C212	15		DI-15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C213	1000		EF-001	MFT-1000		CCF-102	CT280A	
C214	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C215	1000		EF-001	MFT-1000		CCF-102	CT280A	
C216	2		NPO-DI 2.2	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C217	1.5 N220							
C218	10 NPO		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C219	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C220	1000		DI-1000	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C221	10000		DI-10000	DD-103	BYA10S1	CCD-103	GP110	10TS-S10
C222	100		EF-0001	MFT-100				
C223								

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	8200Ω	
R202	4.7meg	
R203	470K	

ITEM No.	RATING	REMARKS
R204	10K	
R205	220K	
R206	2200Ω	

ITEM No.	RATING	REMARKS
R207	15K	
R208	4700Ω	

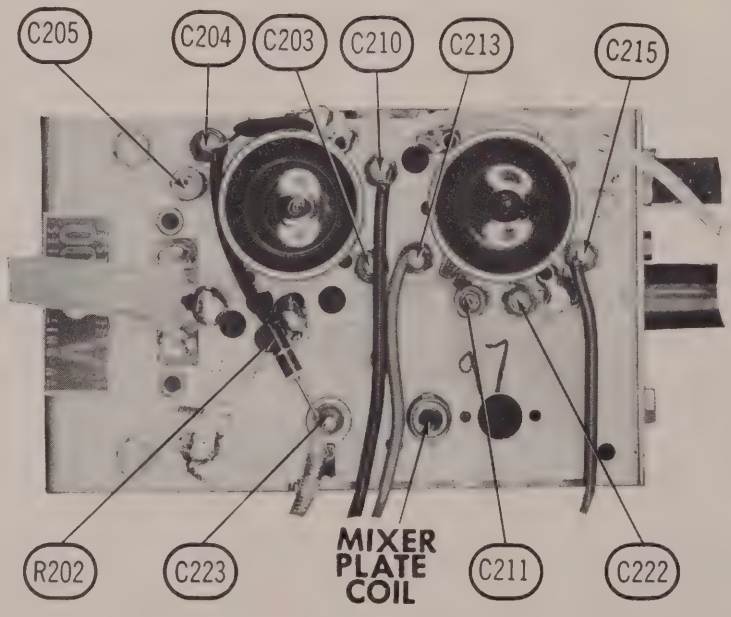
TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

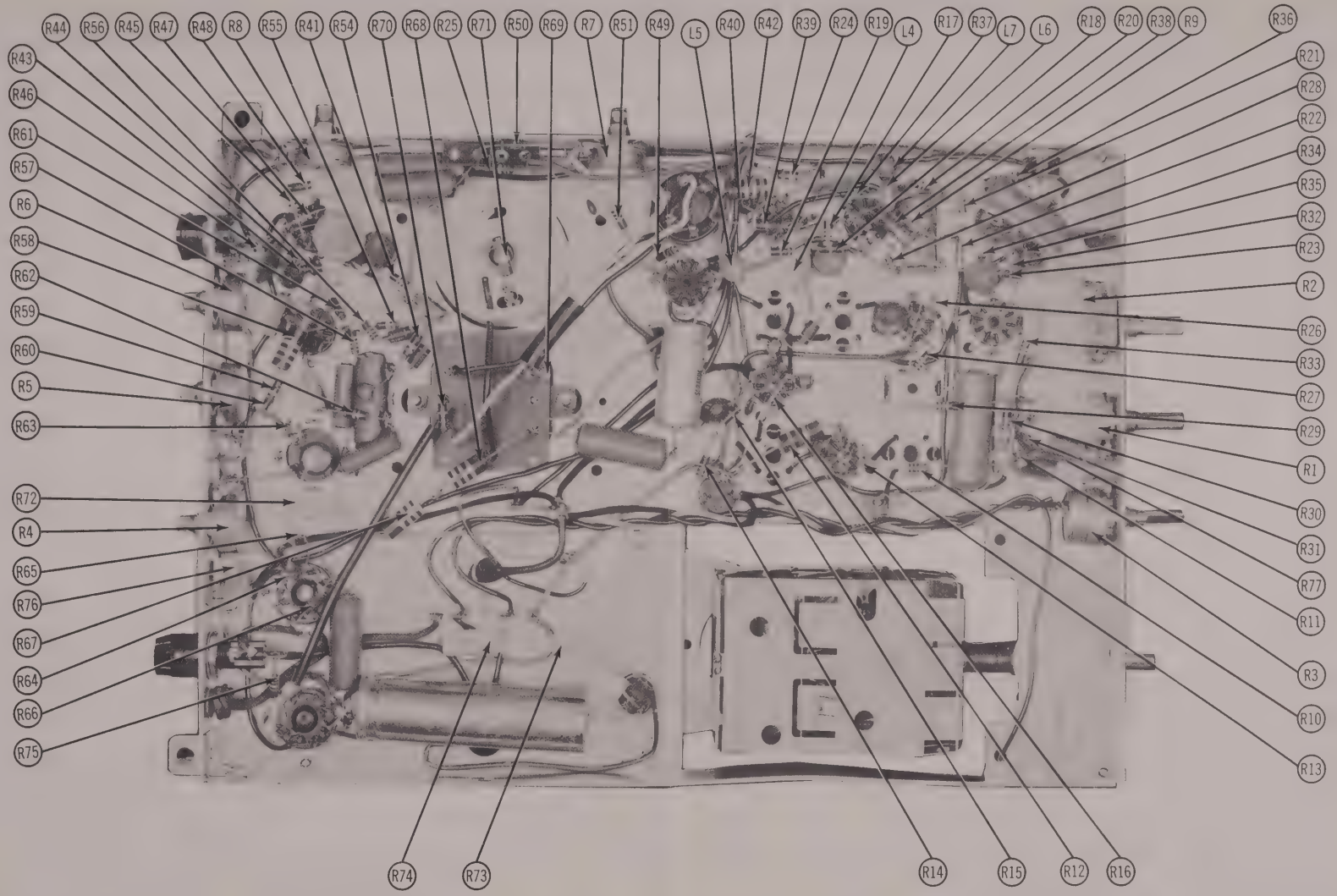
Set the Fine Tuning at the center of its range. One slug for HIGH band adjustment is located at 1 o'clock, and should be adjusted first. The LOW band adjustment is located at 6 o'clock. Adjust for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



TUNER—TOP VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	[illegible]	V8	Vert. Mult.	12AU7A
V2	2nd Video IF Amp.	[illegible]	V9	Vert. Output	6CM6
V3	Video Output-AGC Keying	6AW8A	V10	Horiz. Mult.	12AU7A
V4	Sound IF Amp.	6BZ6	V11	Horiz. Output	6DQ6A
V5	Ratio Det. - AF Amp	6BN8	V12	Damper	6AX4GT
V6	Audio Output	6AQ5	V13	HV Rect.	1G3GT
V7	Noise Limiter-Sync Sep.	6BH8 (6CB8)*			

* Alternate.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: Setchell-Carlson PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V14	21CBP4A	21CBP4A ①	21CBP4-A ①	21CBP4/ 21CBP4A	21CBP4/ 21CBP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: Setchell-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	200	300		PRL-07S	BR30035	WS343	TD-200-300	TVA-1480	
C2A	≙140	350		AFH3-39-98	DD048				
B	≙140	350			BR10035			TVLS-3648*	
C	≙20	350							
C3	5	150		SRE150V5	BBR4-150	TT150X5	TD-4-150	TVA-1403	
C4	100	50		PRL2360	BR1005	TC3501	TD-100-50	TVA-1310	
C5	5	50		PWE50005	BCS-50	TT50X5	ML5-50	TE-1303	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No
C6	100 5%		1469-0001	TCZ-100	22R5T1	CM-20B-101J	MCE235	MS-31
C7	.47 200V		P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47
C8	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C10	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C11	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C12	3.3 5%		NPO-SI 3.3	TCZ-3R3	C10V33C		CNO-533	10TCC-V33
C13	10 5%		NPO-SI 10	TCZ-10	C10Q1C	CM-19B-100J	CNO-410	10TCC-Q10
C14	1.5 5%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C15	56 10%		1469-000056	TCZ-56	22R5Q56	CM-19B-560J	CNO-456	MS-456
C16	56 10%		1469-000056	TCZ-56	22R5Q56	CM-19B-560J	CNO-456	MS-456
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C18	10 5%		NPO-SI 10	TCZ-10	C10Q1C	CM-20B-100J	CNO-410	10TCC-Q10
C19	10 5%		NPO-SI 10	TCZ-10	C10Q1C	CM-20B-100J	CNO-410	10TCC-Q10
C20	270 10%		1469-00027	TCZ-270	22R5T27	CM-20B-271K	CNO-327	MS-327
C21	20 10%		1469-00002	TCZ-20	22R5Q3	CM-20B-200K	CNO-422	MS-420
C22	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C23	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C24	5000 1000V		BPD-005	DD-503	BYA10D5	CCD-503	GP250	5HK-D50
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C28	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C29	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C33	100 10%		1469-0001	TCZ-100	22R5T1	CM-20B-101K	MCB235	MS-31
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C35	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C36	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C41	30000		BPD-03	DD-303	BYB6S1	CCD-303	GP130	5HK-S30
C42	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47
C43	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C44	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C45	100 5%		1469-0001	TCZ-100	22R5T1	CM-20B-101J	MCE235	MS-31
C46	100 5%		1469-0001	TCZ-100	22R5T1	CM-20B-101J	MCE235	MS-31
C47	1000		BPD-001	DD-103	BYA10D1	CCD-103	GP210	5HK-D10
C48	.0033 400V 10%		V84C4D33-10%		PME3D33	5DP-1-332	GEM-16233	5TM-D33
C49	.0033 400V 10%		V84C4D33-10%		PME3D33	5DP-1-332	GEM-16233	5TM-D33
C50	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C51	100 10%		1469-0001	TCZ-100	22R5T1	CM-20B-101K	MCB235	MS-31
C52	680 10%		1469-00068	DD-681	1R5T68	CM-20B-681K	MCJ349	MS-368
C53	680 10%		1469-00068	DD-681	1R5T68	CM-20B-681K	MCJ349	MS-368
C54	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C55	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C56	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Setchell-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg	½	817	B-88	A47-5meg-Z	Q13-141	U85	Volume
B	Shaft			Not Req.		Not Req.	Not Req.	
R2	15K	½	811	BT-154†		Q13-116X	UT153	Contrast
	10K tap							
R3A	500K	½	816	B-80-S	A47-500K-Z	Q33-133	U48	Tone
B	Shaft			Not Req.	F8-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	TS-1	U8-26	Power Off-On
R4A	2.5meg	½	803	BX-83	A47-2.5meg-S	B11-239	SU565	Brightness
B	Shaft			Not Req.	FKS-1/4	SK8	Not Req.	
R5A	2.5meg	½	803	BX-83	A47-2.5meg-S	B11-239	SU565	Horiz. Hold
B	Shaft			Not Req.	FKS-1/4	SK8	Not Req.	
R6A	2.5meg	½	803	BX-83	A47-2.5meg-S	B11-239	SU565	Vert. Hold
B	Shaft			Not Req.	FKS-1/4	SK8	Not Req.	
R7A	3000Ω	½	801	AB-8	B47-3000-S	B11-112	SU8	Height, Top (Vert. Lin.)
B	Shaft			AK-1	Not Req.	SK5	Not Req.	
R8A	2.5meg	½	803	BX-83	A47-2.5meg-S	B11-239	SU565	Height, Bottom
B	Shaft			Not Req.	FKS-1/4	SK8	Not Req.	

†Do not use 5K Tap

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R9	220K	
R10	8200Ω	
R11	220K	
R12	5600Ω 2W	
R13	68Ω	
R14	180Ω	
R15	82Ω	
R16	160Ω	
R17	47K	
R18	1meg	
R19	6800Ω	
R20	22K	
R21	3900Ω	
R22	3900Ω 1W	
R23	2200Ω	
R24	470K	
R25	220K	
R26	470Ω	
R27	47K	
R28	180Ω	
R29	180Ω	
R30	68K	
R31	4.7meg	

ITEM No.	RATING	REMARKS
R32	470K	
R33	22K	
R34	1meg	
R35	22K	
R36	330Ω 1W	
R37	4700Ω	
R38	47K 1W	
R39	2.2meg	
R40	22K	
R41	47K	
R42	47K 2W	
R43	8200Ω	
R44	3900Ω	
R45	220K	
R46	4700Ω	
R47	470K	
R48	1meg	
R49	4.7meg	
R50	8200Ω	
R51	470Ω	
R52	470Ω	
R53	470Ω	
R54	100K	

ITEM No.	RATING	REMARKS
R55	100K	
R56	470K	
R57	68K	
R58	27K 2W	
R59	68K	
R60	1meg	
R61	1200Ω	
R62	15K	
R63	150K	
R64	8200Ω	
R65	1meg	
R66	120Ω	
R67	33K 2W	
R68	33K 2W	
R69	3900Ω	
R70	22Ω	
R71	2.2Ω 1W	
R72	2000Ω 5W	
R73	200Ω 7W	
R74	2Ω 5W	
R75	470K	
R76	3Ω 5W	
R77	2.2meg	

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA: Setchell-Carlson PART No.	Gramer PART No	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	NOTES
L1	1st Video IF							
L2	2nd Video IF							
L3	3rd Video IF							
L4	RF Choke						12uh	
L5	Shunt Peaking Coil		19-4400	19-4400	TV-202	6136	400uh	
L6	Series Peaking Coil		19-4400	19-4400	TV-203	6136	400uh	
L7	Series Peaking Coil		19-3250	19-3250	TV-185	6181	VP-6	225uh
L8A	Sound Take-Off							
B	41.25MC Trap							
L9	Ratio Detector		17-3497	17-3497	TV-115	6205	SD-4	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI	RATING: SEC 1	RATING: SEC 2	REPLACEMENT DATA: Setchell-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ 1.5A	110V @ .700A	2.5V tap @6.3V ② 7A	M1018A0U ①						

① Alternate Part #M1018A.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: Setchell-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	815C	26S13 ①	A-2852 ①				26S13 ①	A-142X
	Alt. Vert. Output	815B	26S13 ①	A-2852 ①				26S13 ①	A-142X
T3	Yoke-Horiz. (30MH)	Y109	Y-16 ②	MDF-82 ②③	Y90F19/43 ②	PCM2045 ②③	DY-18A ②	Y-16 ②	T-41 & NW-1 & YC-1
	(90°)-Vert. (38MH)								
T4	Horiz. Output	TWF90							

① Drill new mounting hole(s).
② Requires new rear cover and centering device.
③ Remove horizontal damping network from yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: Setchell-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	6000Ω	3-4Ω	M10288C ①	34852	A-2931	AU-802	A-3878	34852	S-3X	① Alternate Part #7M0028 used in some versions.

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V C IMP	REPLACEMENT DATA: Setchell-Carlson PART No.	QUAM PART No	NOTES
SP1	6"	PM	3-4Ω		8A1	

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Setchell-Carlson PART No	REPLACEMENT DATA
K1	Sync Sep. Grid	5mmf, 270mmf, 10000mmf, 10K, 330K, 2.2meg		Centralab PC-264

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: Setchell-Carlson PART No.	INTERNATIONAL PART No.	ITT PART No	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	230A		5R4 ①	SD500 ①	40K ①	SR500 ①	① Silicon Type.
M2	.230A		5R4 ①	SD500 ①	40K ①	SR500 ①	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: Setchell-Carlson PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No FUSE	HOLDER
M3	3AG	3A 250V			312002 (3AG 2A 250V)	342001	AGC 3	HKP

CRYSTAL DIODES

ITEM No.	CRKG. TYPE	REPLACEMENT DATA: Setchell-Carlson PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No	NOTES
M4	1N80		1N80	1N80	1N80	Video Detector (Pigtail)
M5	1N80		1N80	1N80	1N80	Horiz. AFC (Pigtail)
M6	1N80		1N80	1N80	1N80	Horiz. AFC (Pigtail)

MISCELLANEOUS

ITEM No	PART NAME	Setchell-Carlson PART No.	NOTES
M7	Tuner	57B48	VHF

CABINETS & CABINET PARTS

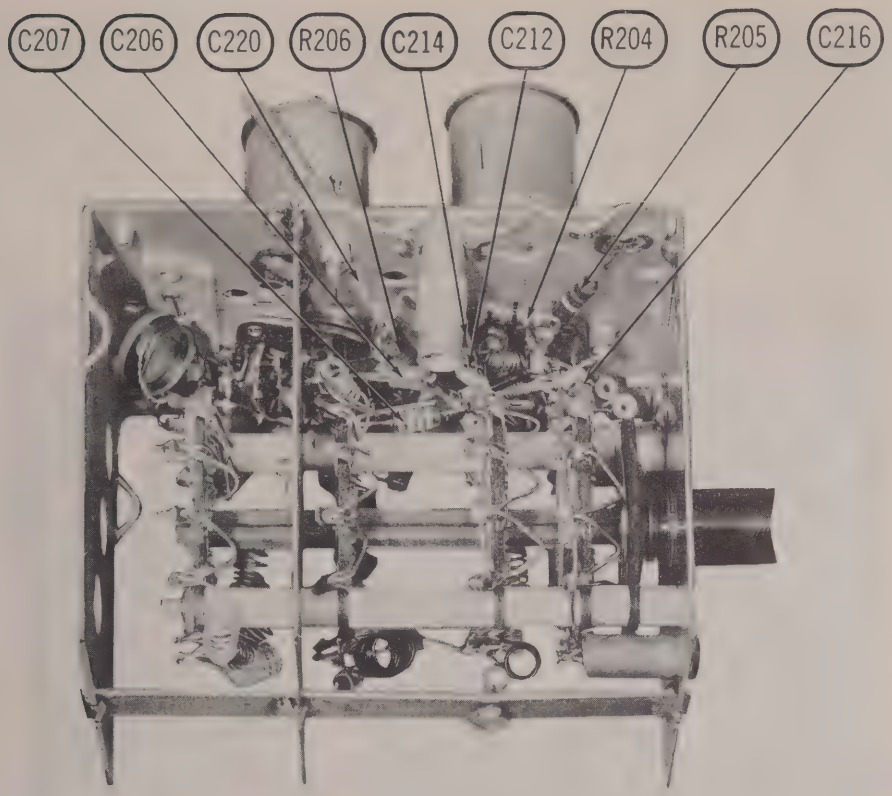
When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color

WIRING DATA

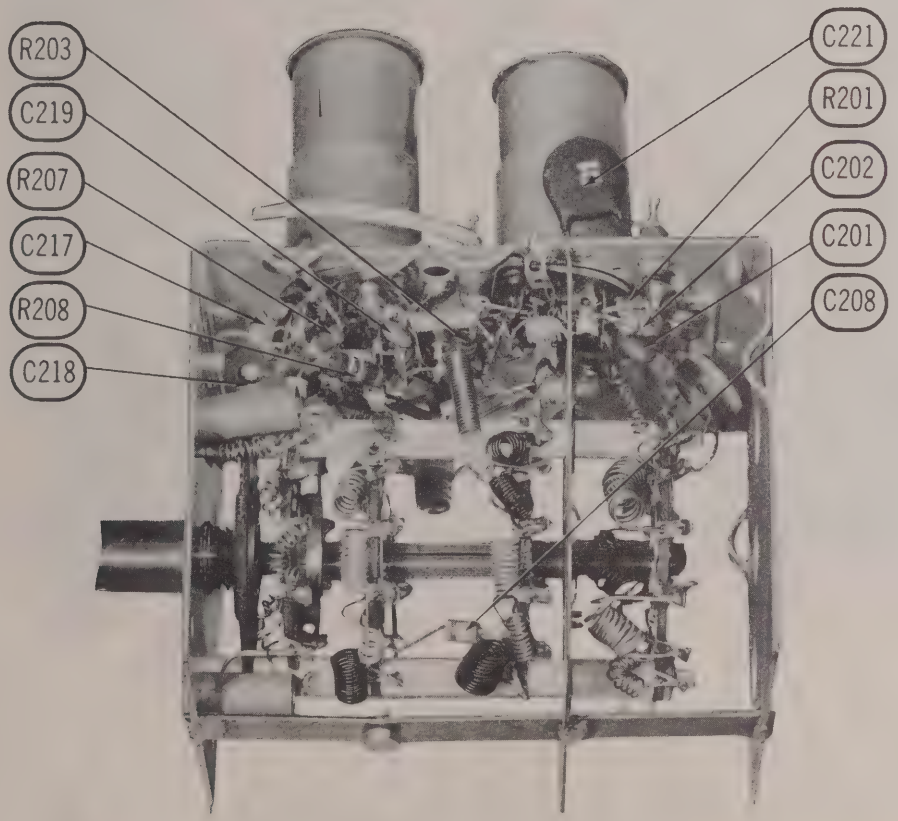
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8736 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8674
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8484 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

SETCHELL-CARLSON MODELS T60, 60C (Ch. 259)

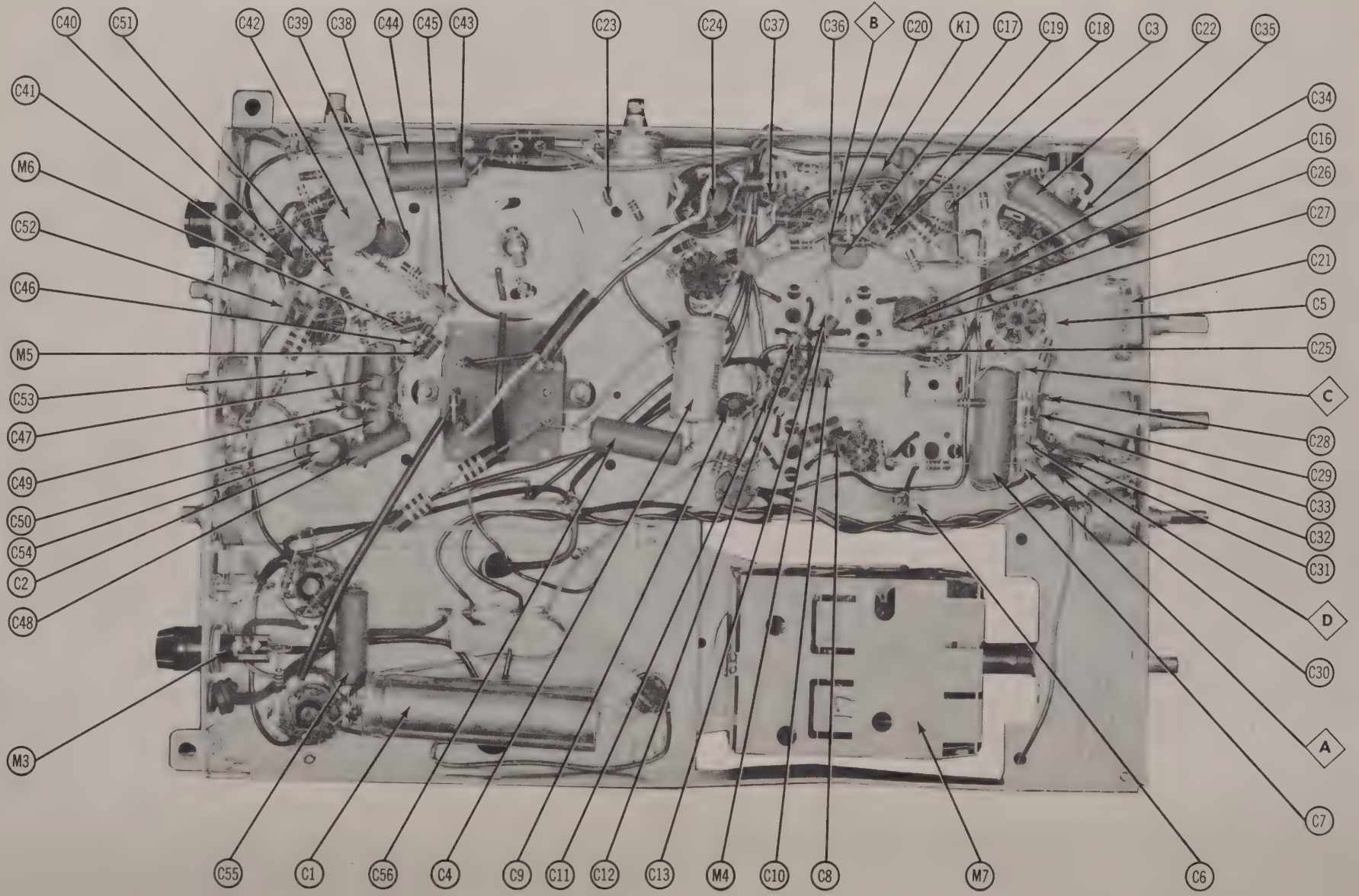
FOLDER 2



TUNER-LEFT SIDE



TUNER-RIGHT SIDE



CHASSIS BOTTOM VIEW - CAPACITOR & MISC IDENT.

CHASSIS TOP VIEW

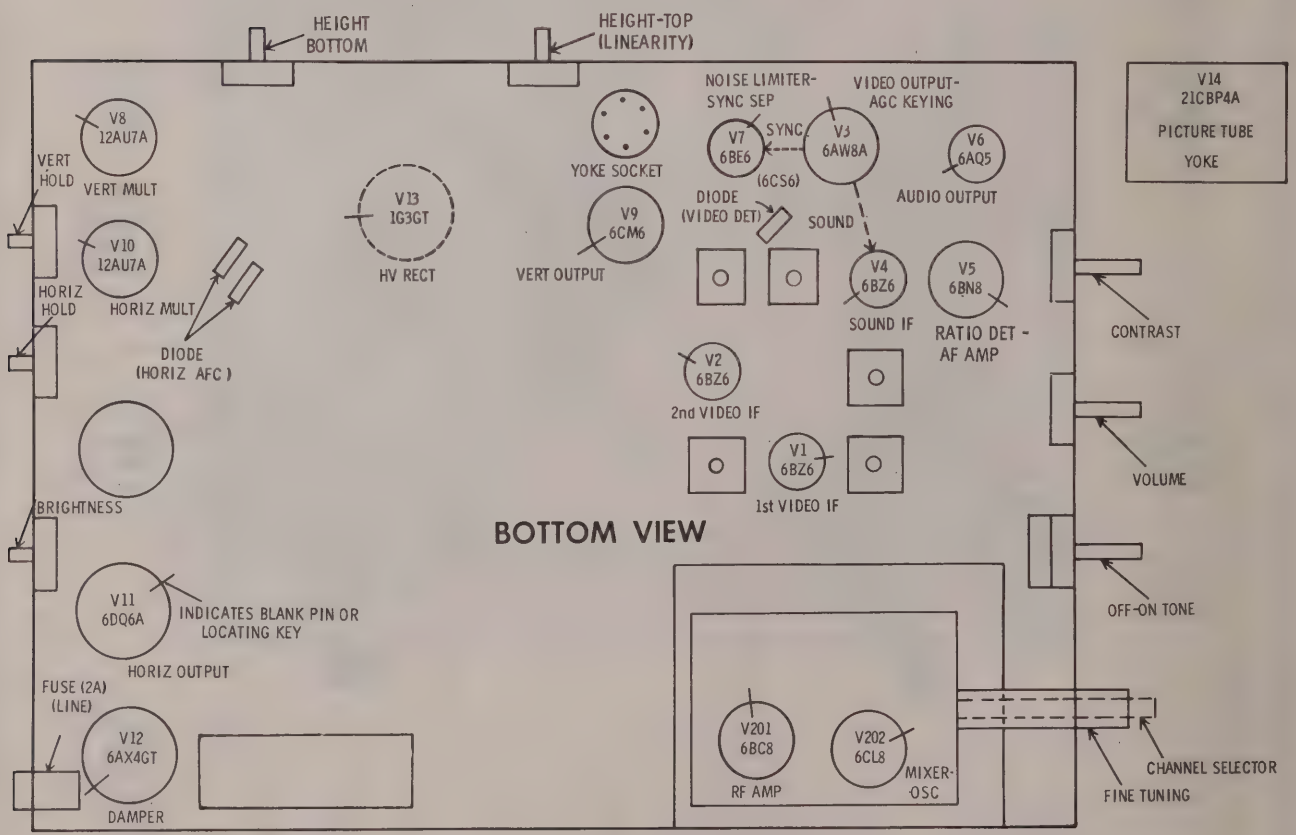
SETCHELL-CARLSON
MODELS T60, 60C (Ch. 259)

RESISTANCE MEASUREMENTS

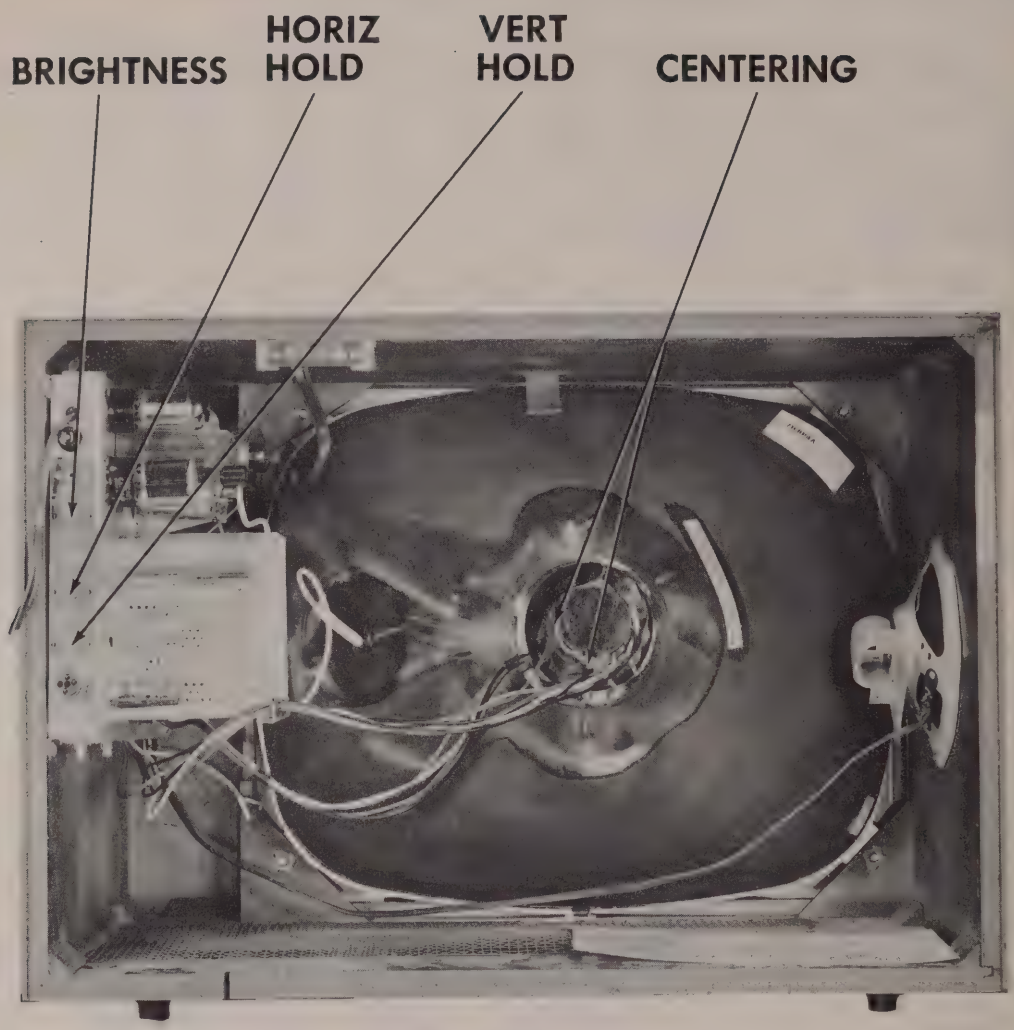
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	230K	68Ω	.1Ω	0Ω	†5800Ω	†5800Ω	0Ω		
V2	6BZ6	▲82Ω	INF	.1Ω	0Ω	†380Ω	†380Ω	INF		
V3	6AW8A	†47K	†52K	440K	.1Ω	0Ω	0Ω	1meg	†52K	†7800Ω
V4	6BZ6	1.4Ω	180Ω	0Ω	.1Ω	†670Ω	†47K	0Ω		
V5	6BN8	INF	22K	INF	.1Ω	0Ω	0Ω	†470K.	4.7meg	0Ω
V6	6AQ5	1meg	330Ω	0Ω	.1Ω	†2400Ω	†2000Ω	1meg		
V7	6BE6	†2.2meg	0Ω	0Ω	.1Ω	†69K	†47K	2.2meg		
V8	12AU7A	• †2.3meg	• 600K	4700Ω	0Ω	0Ω	†220K	3900Ω	4700Ω	.1Ω
V9	6CM6	†420Ω	NC	4.7meg	.1Ω	0Ω	4.7meg	• 1000Ω	NC	†770Ω
V10	12AU7A	†27K	650K	1200Ω	0Ω	0Ω	†150K	68K	1200Ω	.1Ω
V11	6DQ6A	TP	0Ω	NC	‡66K	1meg	NC	.1Ω	0Ω	TOP CAP ‡32Ω
V12	6AX4GT	NC	NC	¶	NC	†200Ω	TP	0Ω	.1Ω	
V13	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡250Ω
V14	21CBP4A	.1Ω	•225K	Pin 6 †200Ω	Pin 10 ‡14Ω	Pin 11 • 500K	Pin 12 3.2Ω			
V201	6BC8	†200Ω	INF	INF	0Ω	.1Ω	INF	1.2meg	0Ω	0Ω
V202	6CL8	15K	▲ 5000Ω	0Ω	0Ω	.1Ω	▲ 2500Ω	▲ 260Ω	0Ω	230K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 240V SOURCE.
‡ MEASURED FROM PIN 3 OF V12.
▲ MEASURED FROM PIN 7 OF V2.

NC NO CONNECTION.
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast controls for a normal picture.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

PHOTOFACT® Folder with CIRCUITRACE*

ADMIRAL
MODEL 739 (Ch. 5F5)

ADMIRAL
MODEL 739 (Ch. 5F5)

TRADE NAME	Admiral Model 739 (Ch. 5F5)
MANUFACTURER	Admiral Corp., 3800 W. Cortland Street, Chicago 47, Illinois
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 - 1620KC
RATING	8.7MA @ 9 Volts DC (No Signal, Min. Volume)
	11MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3 ..... GENERAL CEMENT #9440
A4, A5 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A4	"
3.		"	1400KC	Tune to 1400KC signal	"	A5	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.

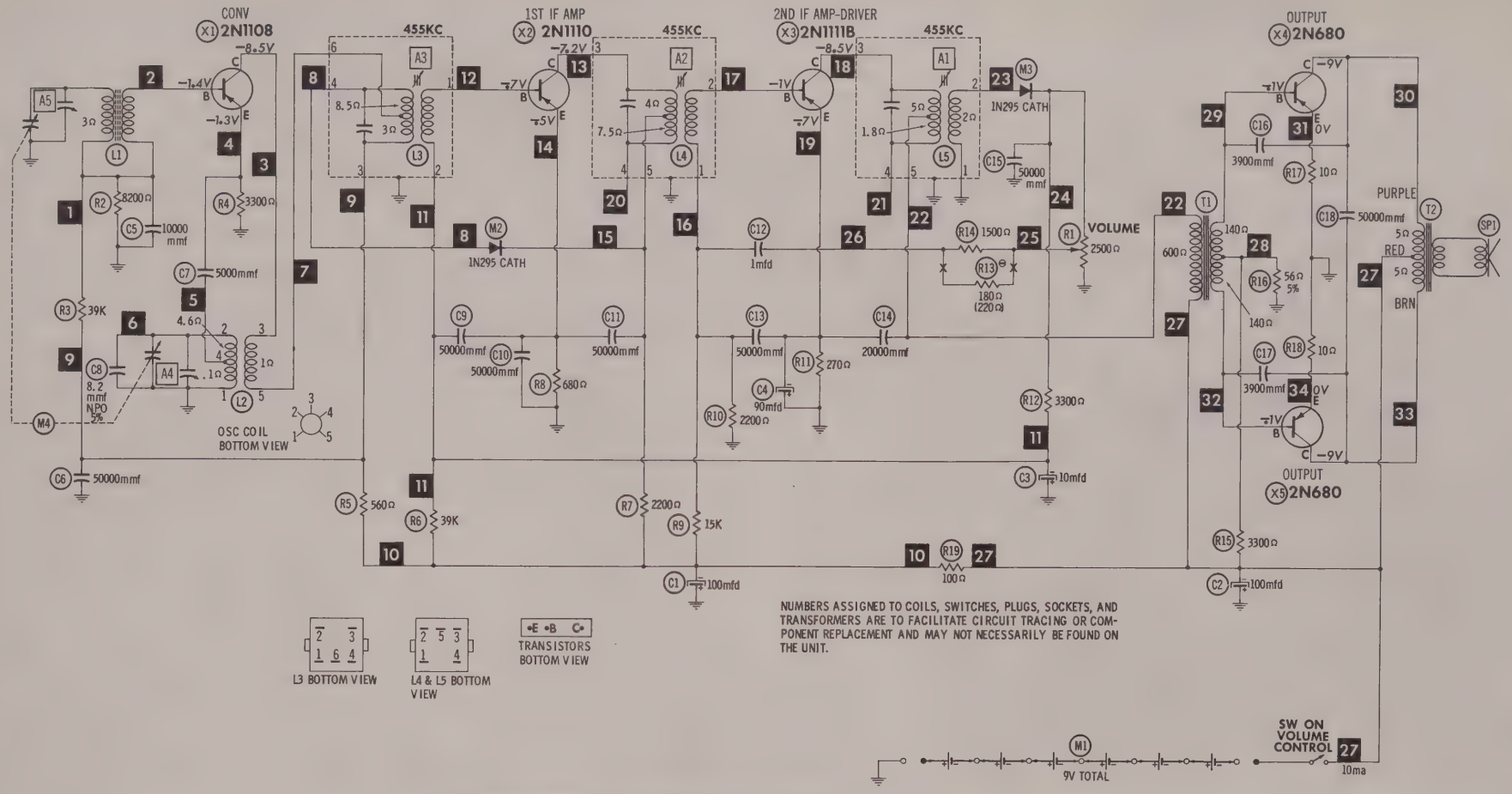
DISASSEMBLY INSTRUCTIONS

1. Remove volume and tuning knobs.
2. Remove two chassis mounting screws from bottom of case. (These screws are not used in some versions.)
3. Open rear cover and remove battery case.
4. Remove two screws from right corners of chassis.
5. With one hand on front escutcheon, slide chassis to right and remove from case.

(Note: When viewed from the rear, the left side of the chassis is secured by two escutheon flanges. The escutheon is held by the chassis under these flanges.)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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ADMIRAL
MODEL 739 (Ch. 5F5)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1108	Converter					PNP
X2	2N1110	1st IF Amplifier					PNP
X3	2N1111B	2nd IF Amp. - AF Amp.					PNP
X4	2N680	Output		2N408	2N360		PNP } Matched
X5	2N680	Output		2N408	2N360		PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	12	67B32-6	BCD1200	ECPB417	PET1500	ML100-15	VL-1140	
C2	100	12	67B32-6	BCD1200	ECPB417	PET1500	ML100-15	VL-1140	
C3	10	3	67B35-6	PWE3010	EC10-3	TT3X10	ML10-6	TE-1053	
C4	90	3	67B32-10	BCD3100	ECPB417	PET1400	ML100-3	VL-1051	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C7	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C8	8.2 NPO 5%		NPO-DI 8.2		C10V82C			10TCC-V82
C9	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C10	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C11	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C12	1mfd			UK-105	WMF1W1E		GEM-21	HY135
C13	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C14	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C15	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50
C16	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	5GA-D39
C17	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	5GA-D39
C18	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2500Ω	1/4	75B36-2					Volume and Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	8200Ω	
R3	39K	
R4	3300Ω	
R5	560Ω	
R6	39K	
R7	2200Ω	

ITEM No.	RATING	REMARKS
R8	680Ω	
R9	15K	
R10	2200Ω	
R11	270Ω	
R12	3300Ω	
R13	180Ω	(2200Ω) * ①

ITEM No.	RATING	REMARKS
R14	1500Ω	
R15	3300Ω	
R16	56Ω 5%	
R17	10Ω	
R18	10Ω	
R19	100Ω	

* Alternate value.

① Not used in some versions.

PRINTED BOARD

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PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	69B235-2						
L2	Osc. Coil	69A223-3						
L3	1st IF Trans.	72C190-7						
L4	2nd IF Trans.	72C190-8						
L5	3rd IF Trans.	72C190-9						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1	1	79B76-4						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	55Ω CT	3-4Ω	Part of SP1							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: ADMIRAL PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	78C156-2 ①	4A1	① Includes T2

BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA: BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V			1		935		M-14M	Six required.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ADMIRAL PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N295	1N295	1N60	1N295	1N295	AVC (Pigtail)
M3	1N295	1N295	1N60	1N295	1N295	Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuning Cap.	68C66-11	2 Gang : Ant. 30-292mmf, Osc. 32-122mmf

CABINETS & CABINET PARTS

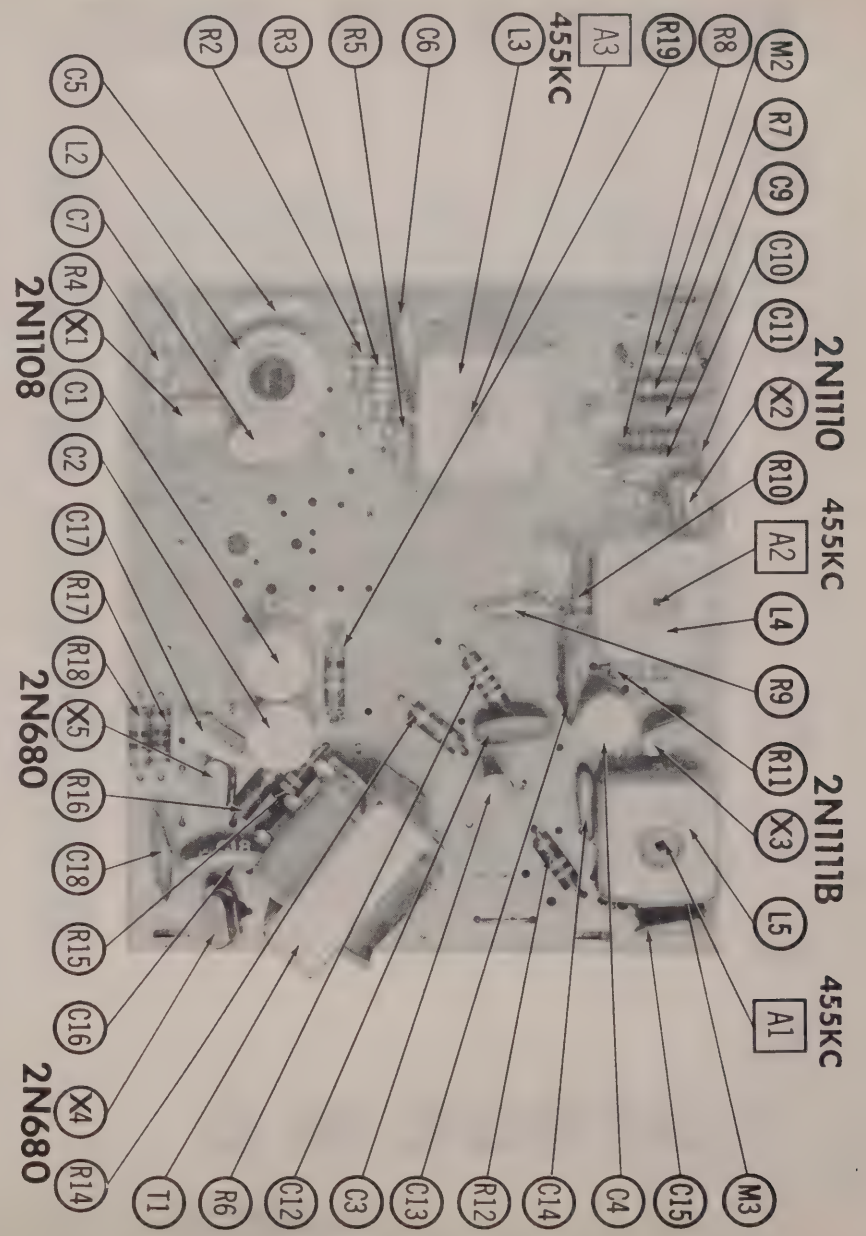
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33B314-1	Tuning
Knob	33B311-1	Volume-Off-On
Cabinet	34D140-1	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ARVIN MODEL 8091 (Ch. 1.49000)

ARVIN MODEL
8091 (Ch. 1.49000)

ARVIN MODEL
8091 (Ch. 1.49000)

TRADE NAME	Arvin Model 8091 (Ch. 1.49000)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 32 Watts, .34 Amp. @ 117 Volts AC (Less Motor)

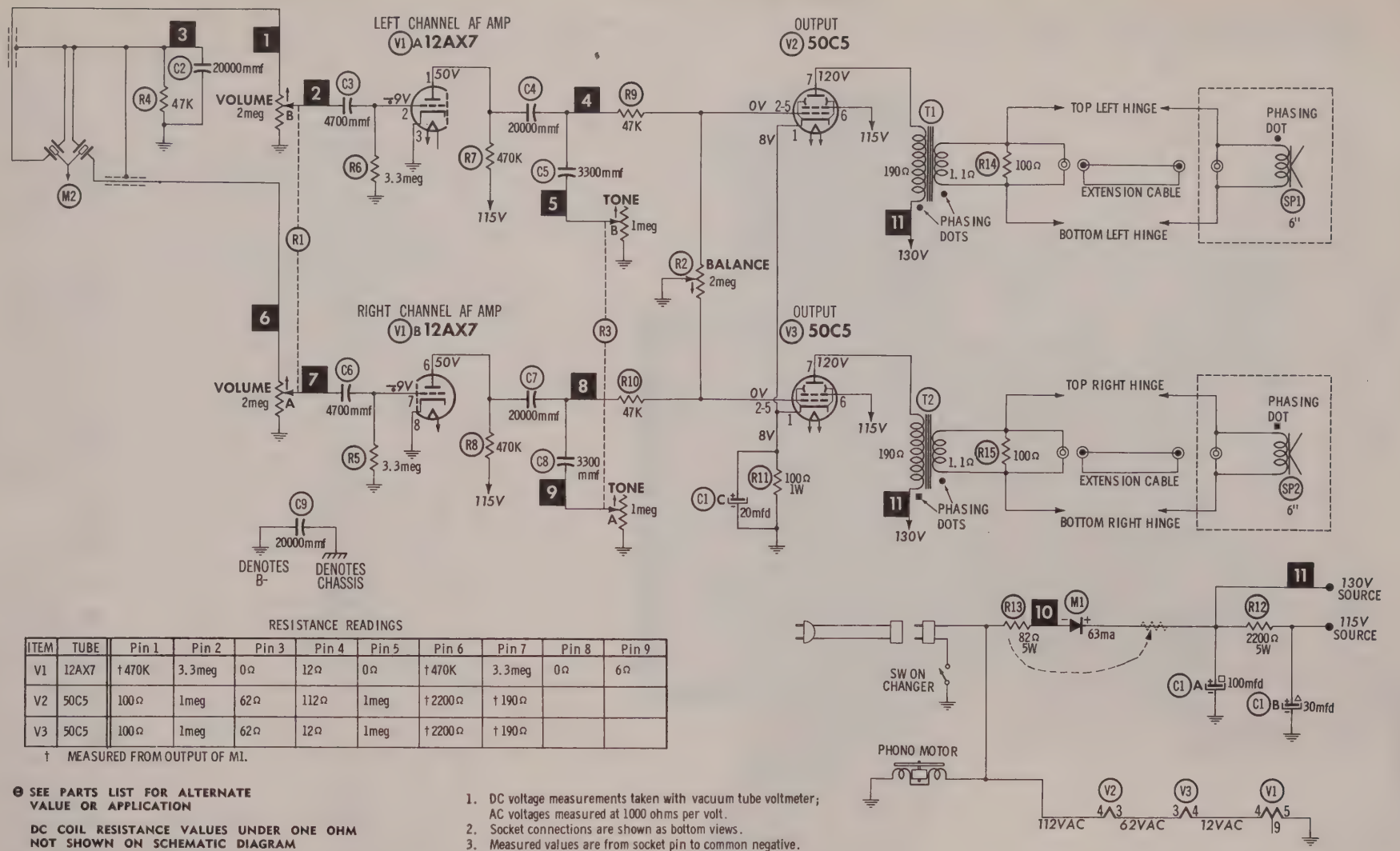
FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16
OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT448

SET 471 FOLDER 4



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†470K	3.3meg	0Ω	12Ω	0Ω	†470K	3.3meg	0Ω	6Ω
V2	50C5	100Ω	1meg	62Ω	112Ω	1meg	†2200Ω	†190Ω		
V3	50C5	100Ω	1meg	62Ω	12Ω	1meg	†2200Ω	†190Ω		

† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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ARVIN MODEL 8091 (Ch. 1.49000)

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •	GENERAL ELECTRIC •		• RAYTHEON •	SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V2 V3	Left Channel Output Right Channel Output	50C5 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■100	150	43711-8			PFP311.2		PCLS-3432.3 *	
B	▲30	150							
C	20	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000		BPD-02	DD-203	BYB6S2	2CP-1-203	B-120	5HK-S20
C3	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C4	20000		BPD-02	DD-203	BYB6S2	2CP-1-203	B-120	5HK-S20
C5	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C6	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C7	20000		BPD-02	DD-203	BYB6S2	2CP-1-203	B-120	5HK-S20
C8	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C9	20000		BPD-02	DD-203	BYB6S2	2CP-203	B-120	5HK-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg		47100-1					Volume, Right Channel
B	2meg							Volume, Left Channel
R2	2meg		45250-17					Balance
R3A	1meg		47100-2					Tone, Right Channel
B	1meg							Tone, Left Channel

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	47K	
R5	3.3meg	
R6	3.3meg	
R7	470K	

ITEM No.	RATING	REMARKS
R8	470K	
R9	47K	
R10	47K	
R11	100Ω 1W	

ITEM No.	RATING	REMARKS
R12	2200Ω 5W	
R13	82Ω 5W	
R14	100Ω	
R15	100Ω	

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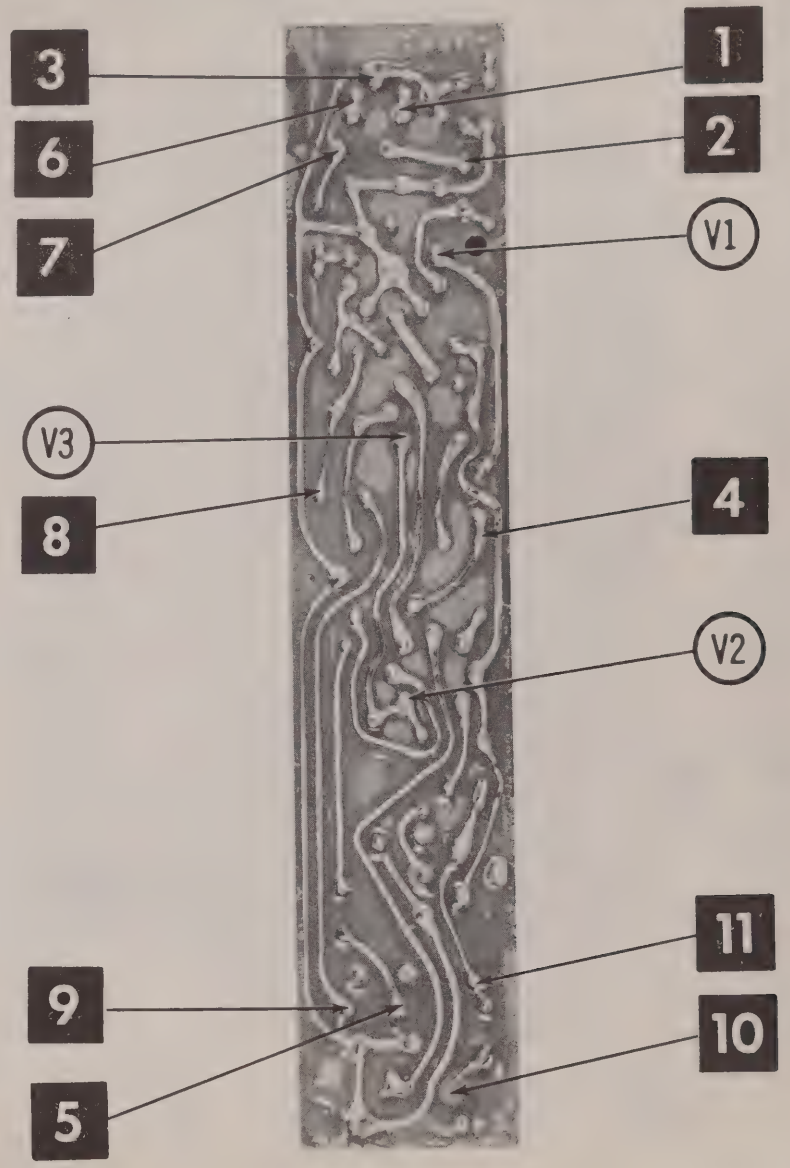
*TRADE-MARK

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	6-8Ω	46200-1							
T2	2600Ω	6-8Ω	46200-1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	6"	PM	6-8Ω	46408-3	6A1	
SP2	6"	PM	6-8Ω	46408-3	6A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ARVIN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.063A	47126-1	HA154	5E4	40K	SR200	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	ARVIN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	46507-4	13T †	Not Req.	* 66	Not Req.			8TA4-S † or 8TA4-D †	8TA4-S

* Use mount PT-3. † Includes mount.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ARVIN PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3		* A-44X † or * A-44XSD † ♦ or * A-44XDD ♦	* W-204DS † or * W-204DD1 ♦	† Jewel ♦ Diamond * Includes Cartridge

CABINETS & CABINET PARTS

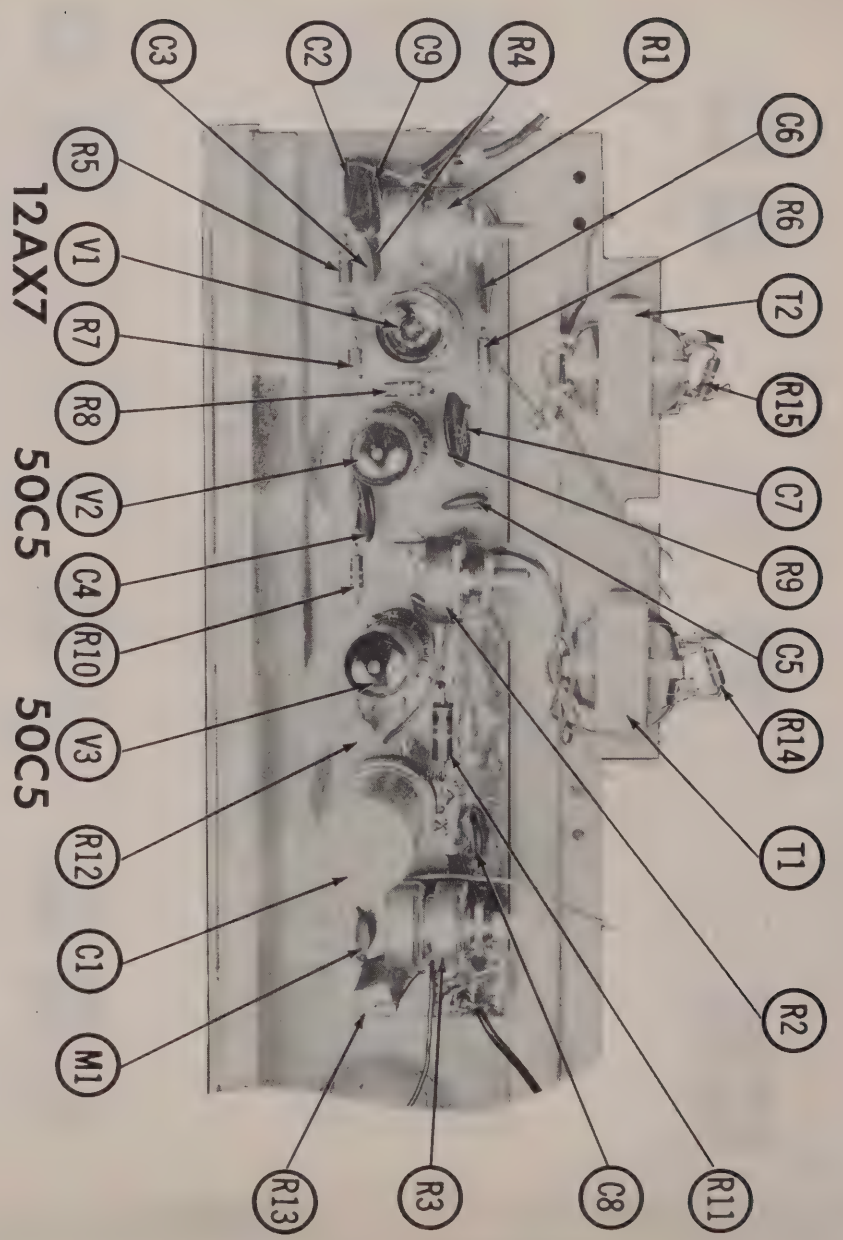
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47018-29	Volume
Knob	47017-29	Tone
Knob	47016-29	Balance
Cabinet	46829-109	Charcoal

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

CONTINENTAL MODEL TR-300

CONTINENTAL
MODEL TR-300

CONTINENTAL
MODEL TR-300

TRADE NAME	Continental Model TR-300
MANUFACTURER	Continental Merchandise Co., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 - 1605KC
RATING	7.8MA @ 9 Volts DC (No Signal, Min. Volume) 15MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A4, A5 ..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1605KC	"	"	A4	"
3.		"	600KC	600KC	"	A5	"
4.		"	1400KC	1400KC	"	A6	Adjust for maximum output while rocking tuning gang.

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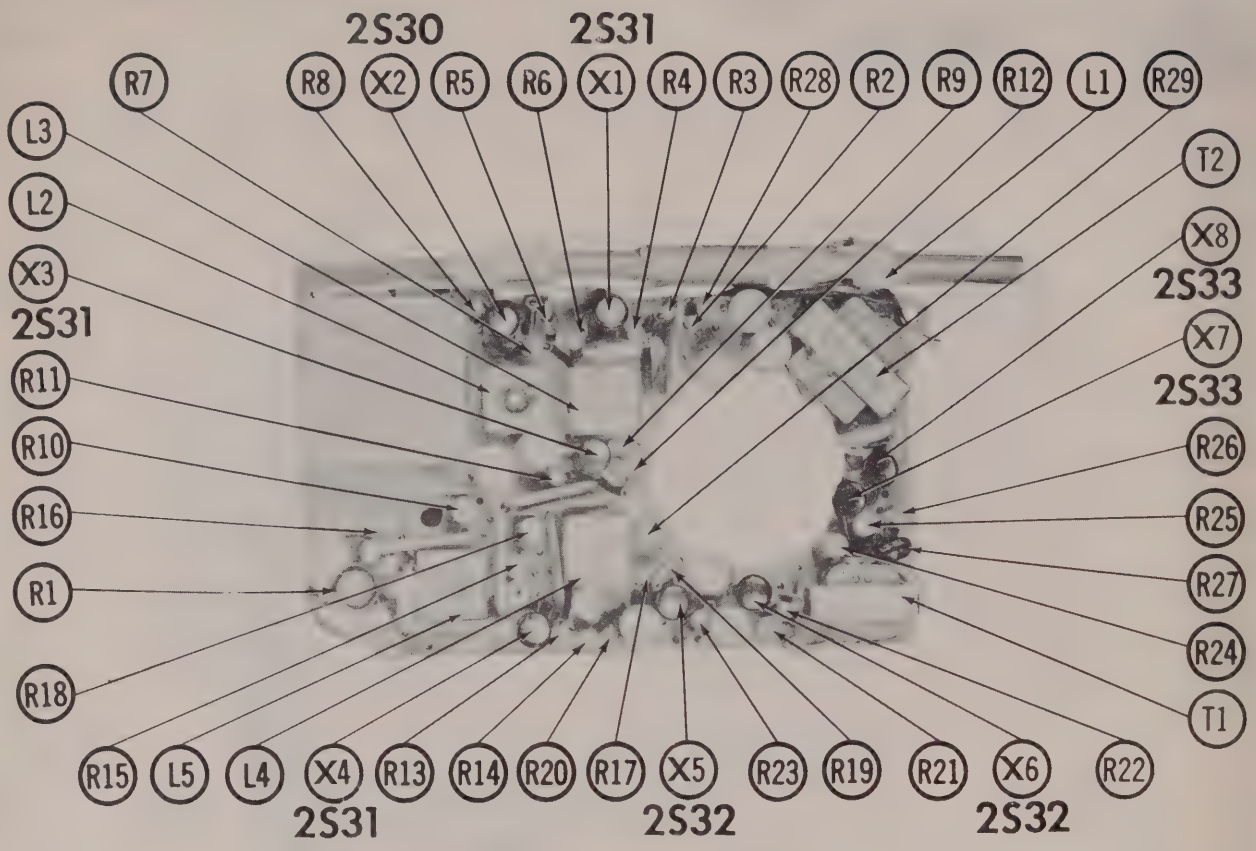
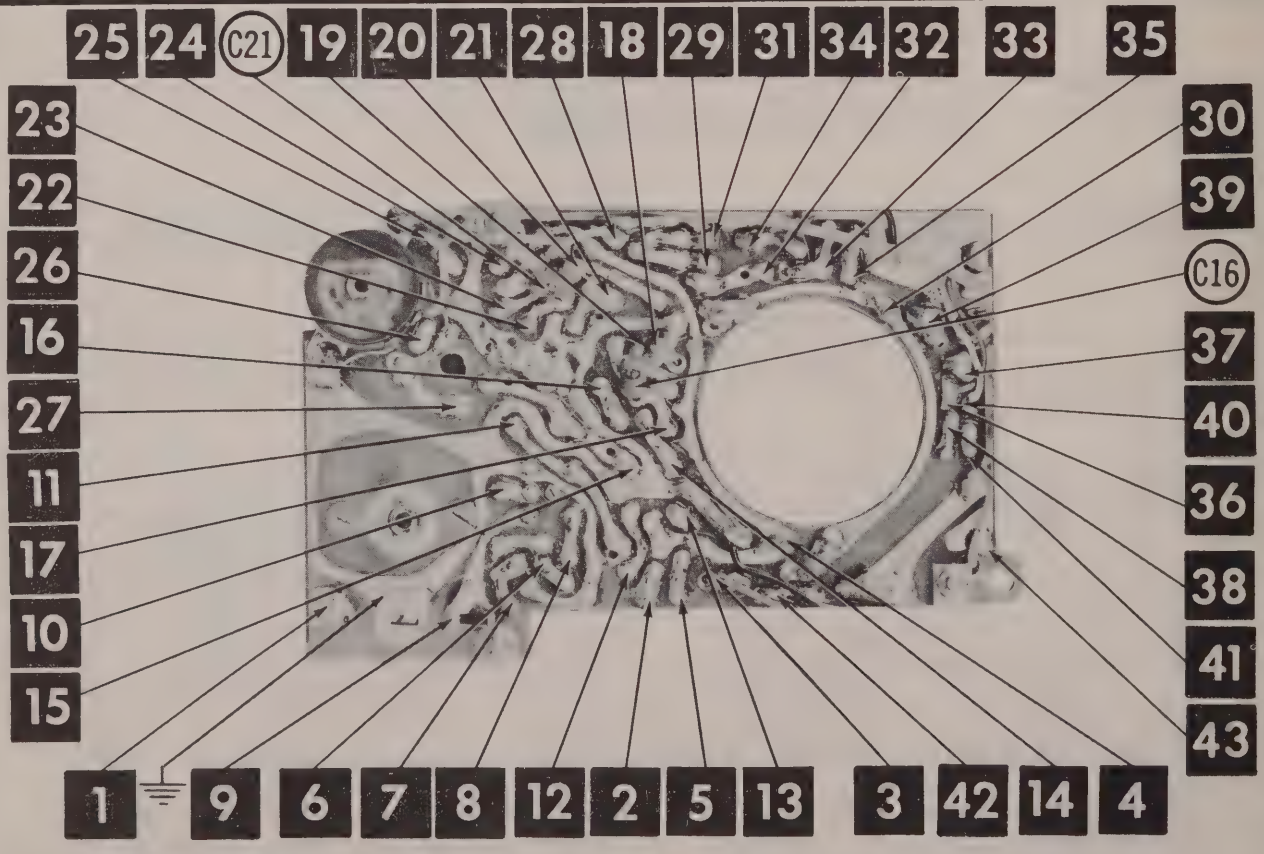
SET 471 FOLDER 5



CHASSIS TOP VIEW — RESISTOR, INDUCTOR & TRANSISTOR IDENT.



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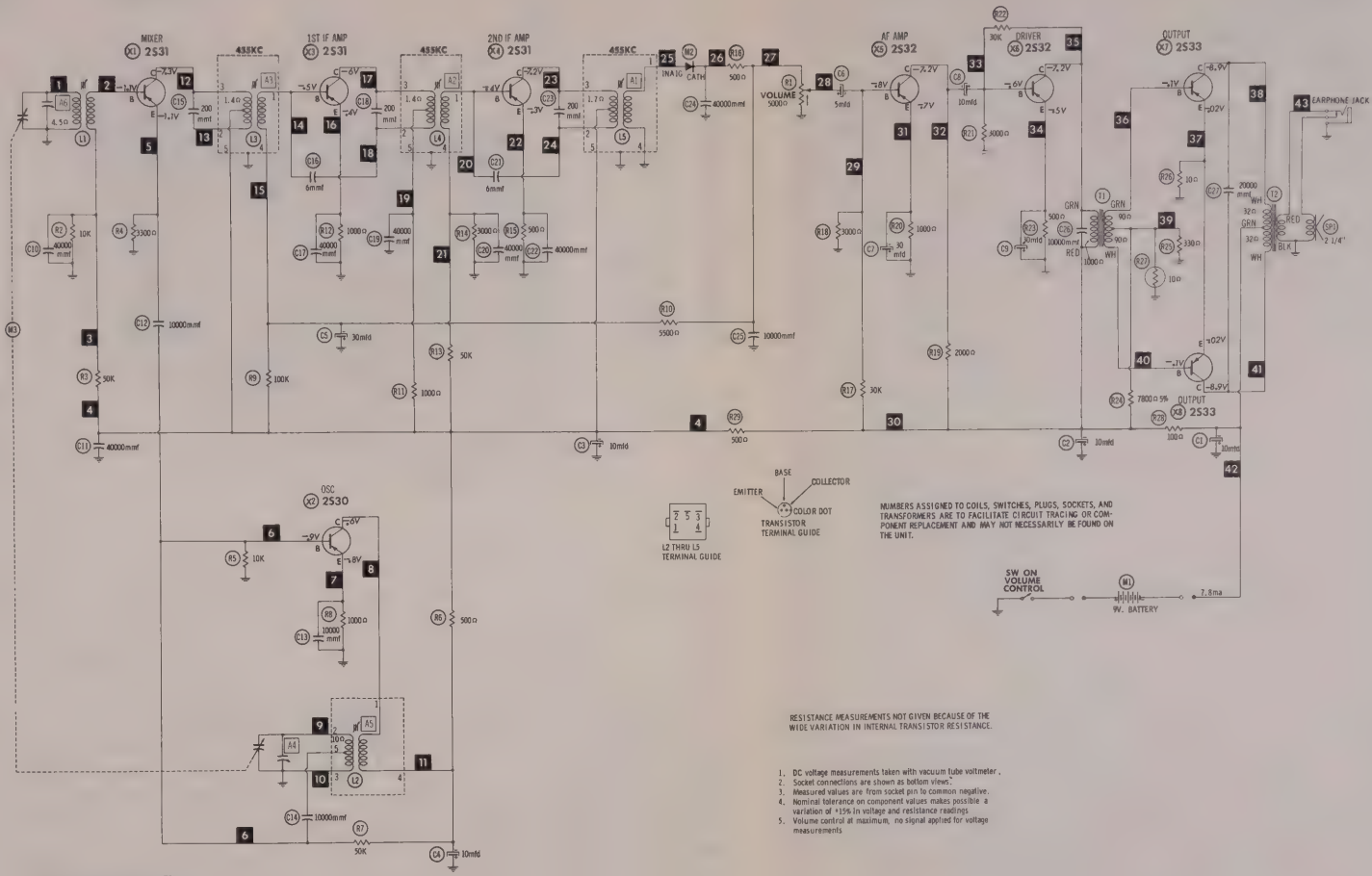

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

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CONTINENTAL MODEL TR-300

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S31	Mixer					PNP
X2	2S30	Oscillator					PNP
X3	2S31	1st IF Amplifier					PNP
X4	2S31	2nd IF Amplifier					PNP
X5	2S32	AF Amplifier					PNP
X6	2S32	Driver					PNP
X7	2S33	Output					PNP) Matched
X8	2S33	Output					PNP) Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10			NLW10-10				
C2	10	10			NLW10-10				
C3	10	10			NLW10-10				
C4	10	10			NLW10-10				
C5	30	3			NLW30-6				
C6	5	3		XPP-3005	NLW5-6		ML5-6		
C7	30	3			NLW30-6				
C8	10	10			NLW10-10				
C9	30	3			NLW30-6				

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C11	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C12	10000		C80V103AM	DA-203	H-05S1		TA-120	TG-S10
C13	10000		C80V103AM	DA-203	H-05S1		TA-120	TG-S10
C14	10000		C80V103AM	DA-203	H-05S1		TA-120	TG-S10
C15	200			DD-201	L10T2	CCD-201	GP320	10TCC-T20
C16	6			DD-060	C10V6C	CCTO-6R8	GP568	5GA-V60
C17	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S40
C18	200			DD-201	L10T2	CCD-201	GP320	10TCC-T20
C19	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S40
C20	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S40
C21	6			DD-060	C10V6C		GP568	5GA-V60
C22	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S40

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C23	200			DD-201	L10T2	CCD-201	GP320	10TCC-T20
C24	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S40
C25	10000		C80V103AM	DA-203	H-05S1		TA-120	TG-S10
C26	10000		C80V103AM	DA-203	H-05S1		TA-120	TG-S10
C27	20000		C80V203AM	DA-203	H-05S20		TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	.2	34.011					Volume and Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	10K	
R3	50K	
R4	3300Ω	
R5	10K	
R6	500Ω	
R7	50K	
R8	1000Ω	
R9	100K	
R10	5500Ω	
R11	1000Ω	

ITEM No.	RATING	REMARKS
R12	1000Ω	
R13	50K	
R14	3000Ω	
R15	500Ω	
R16	500Ω	
R17	30K	
R18	3000Ω	
R19	2000Ω	
R20	1000Ω	
R21	3000Ω	

ITEM No.	RATING	REMARKS
R22	30K	
R23	500Ω	
R24	7800Ω 5%	
R25	330Ω	
R26	10Ω	
R27	10Ω	
R28	100Ω	
R29	500Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Continental PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							
L5	3rd IF Trans.							

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	T-453C						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1100Ω CT	13Ω	OT-503A	TR-105			TA-26	TR-105		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	
SP1	2 1/4"	PM	12-14Ω			

BATTERIES

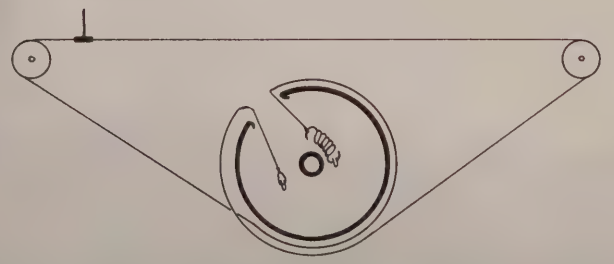
ITEM No.	VOLTAGE	Continental	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
		PART No.	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	BL-006P		D6		276		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Continental PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1NA16		1N60	1N295	1N295	Detector (Pigtail)

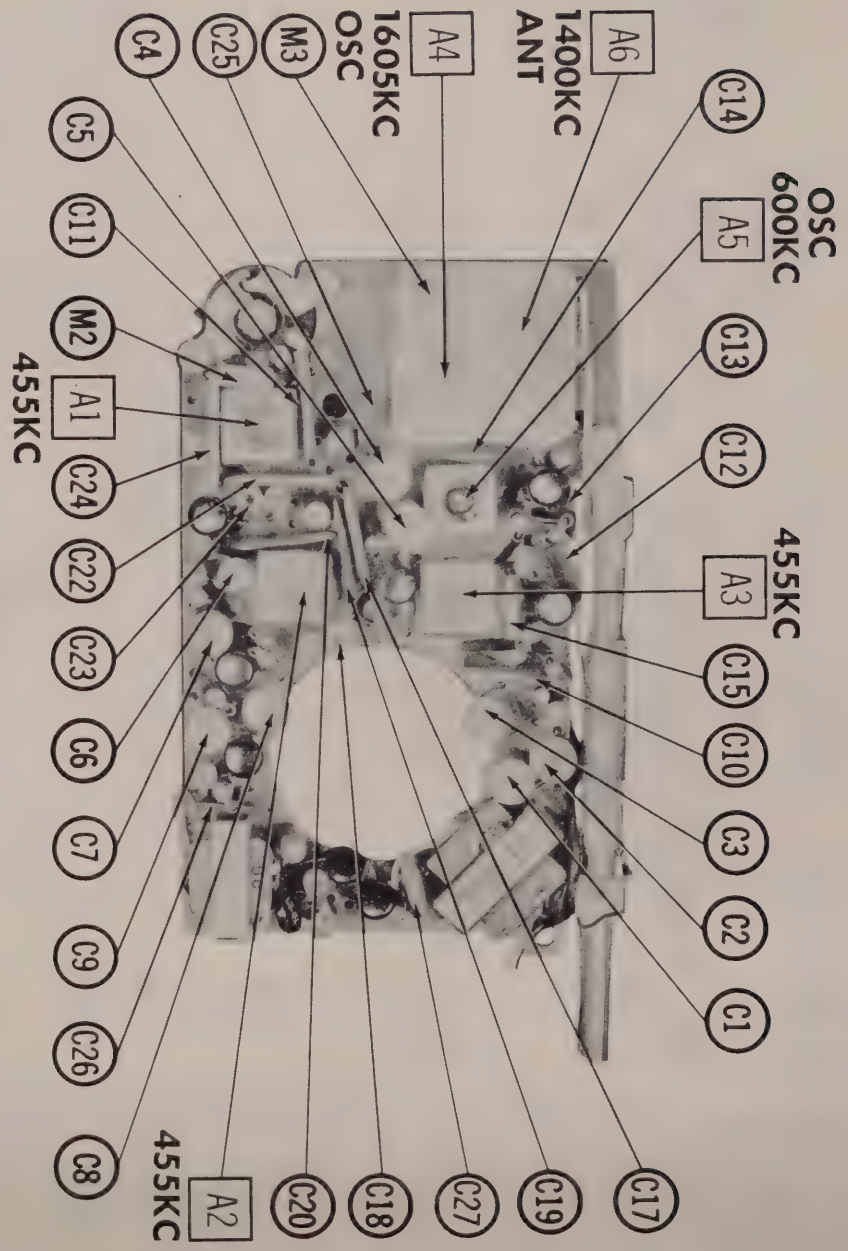
MISCELLANEOUS

ITEM No.	PART NAME	Continental PART No.	NOTES
M3	Tuning Cap.		2 Gang



DIAL CORD STRINGING

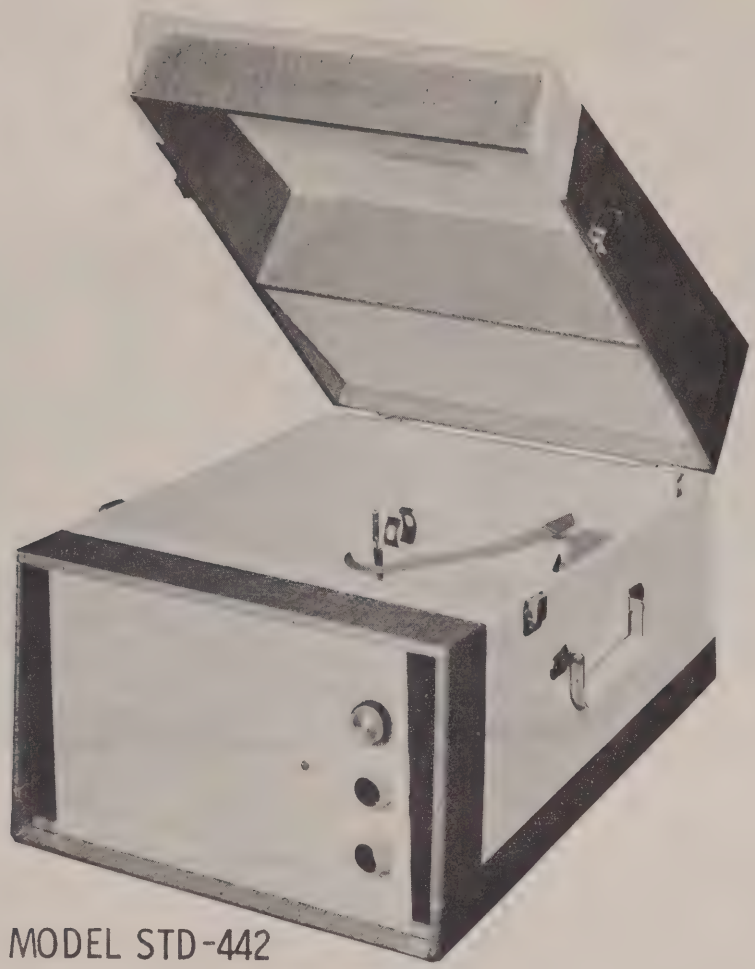
CHASSIS—TOP VIEW



PHOTOFACT® Folder

FANFARE MODELS
STD-24, STD-100, STD-442

FANFARE MODELS
STD-24, STD-100, STD-442



MODEL STD-442

FANFARE MODELS
STD-24, STD-100, STD-442

TRADE NAME	Fanfare Models STD-24, STD-100, STD-442
MANUFACTURER	Fanon Electronic Sales Corp., 919 Park Place, Brooklyn 13, N. Y.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 27 Watts, .3 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18

WHEN REMOVING THE CHASSIS FROM THE CABINET, UNSCREW THE 2 FRONT FEET AND PULL FRONT PANEL FROM BOTTOM. CHANGER LEADS MUST BE DISCONNECTED FROM FRONT PANEL FOR COMPLETE SEPARATION.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JT497

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V2 V3	Left Channel Output Right Channel Output	50C5 ① 50C5 ①

① Model STD-24 uses 35C5 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FANFARE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150		PRS3800	BBRT84215	TCT3117	TDLT-7	TVA-3455	
B	40	150							
C	20	150							
C2	50	10		SRE12V50	NLW50-10	TT10X50	ML50-15	TE-1119	Note 1
C3	50	10		SRE12V50	NLW50-10	TT10X50	ML50-15	TE-1119	Note 1

Note 1. Not used in Model STD-24.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	.047 200V		P288N-047	DF-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	.047 200V		P288N-047	DF-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C9	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	.05 600V		P688N-05	DF-503	CUB6S5	6DP-3-503	GEM-615	6TM-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FANFARE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	52507	F1-68		† QJ-1128R	■ UE4055	Volume, Right Channel
B	2meg	½		R2-68				Volume, Left Channel
R2A	500K	½	52508	B-59	A47-500K-S	Q11-133	U50	Tone, Left Channel
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	½	52508	B-59	A47-500K-S	Q11-133	U50	Tone, Right Channel
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

† "Concentrikit" equivalent: K-6 kit with base elements and shafts: B13-139, P14-016 (Panel)
Not available as a factory assembled unit. B13-139, R1-024 (Rear)

■ "STA-LOC" equivalent: FA26A, RU26A, OS500, IS875.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

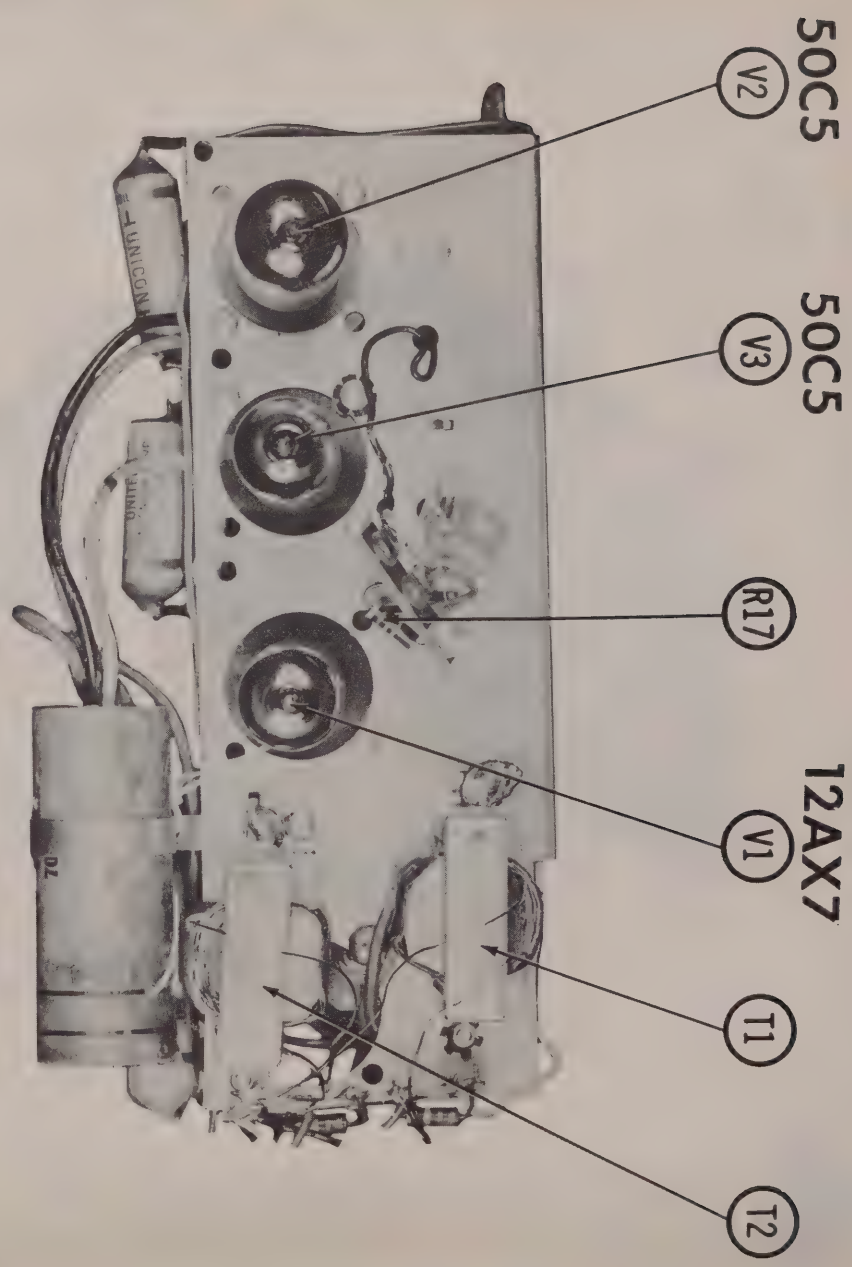
ITEM No.	RATING	REMARKS
R4	180K	
R5	1000Ω	
R6	150Ω	
R7	22K 5%	
R8	180K	

ITEM No.	RATING	REMARKS
R9	1000K	
R10	150Ω	
R11	22K 5%	
R12	3Ω	
R13	3900Ω	

ITEM No.	RATING	REMARKS
R14	2200Ω 1W	
R15	150Ω 5W	
R16	12Ω 1W	(15Ω 1W) *
R17	47K	Note 1
R18	100Ω 5W	Note 1

* Alternate value.
Note 1. Not used in Model STD-24.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FANFARE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	OT148①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	① Alternate Part #1033
T2	2400Ω	3-4Ω	OT148①	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	FANFARE PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	P/N 8PZ	8A21	
SP2	8"	PM	3-4Ω	P/N 8PZ	8A21	
	4"x 6"	PM				Model STD-24
	4"x 6"	PM				Model STD-24

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	FANFARE PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.067A	①	1235AH ①	RS150 ①	75 ①	SR200 ②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	FANFARE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		13TB① 13T ②	Not Req.	66	Not Req.			8T-S ①	Not Req.

① Used when original cartridge is a Sonotone 8T.
② Used when original cartridge is an Astatic 13T.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

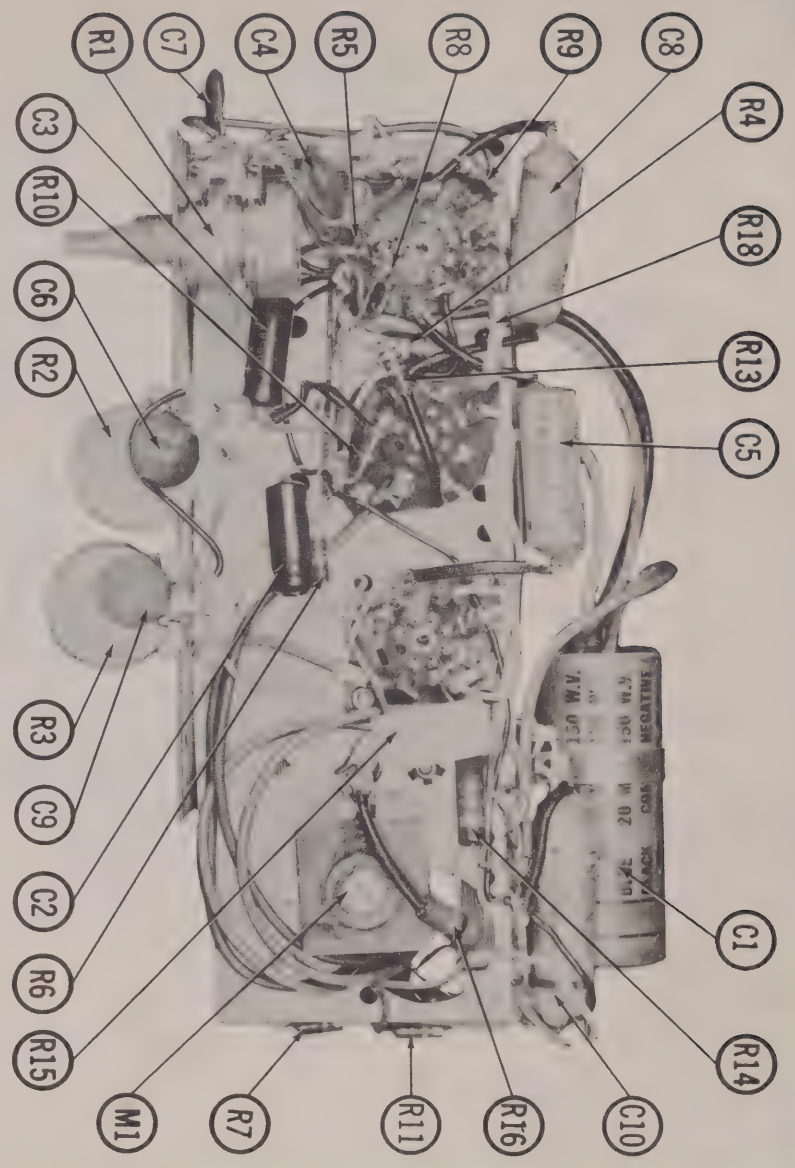
ITEM No.	REPLACEMENT DATA			REMARKS
	FANFARE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)	* W-101STS † or * W-102S † or * W-101STD ♦	S69X † or S69XD † ♦ or S69XDD ♦	† Jewel ♦ Diamond * Includes Cartridge

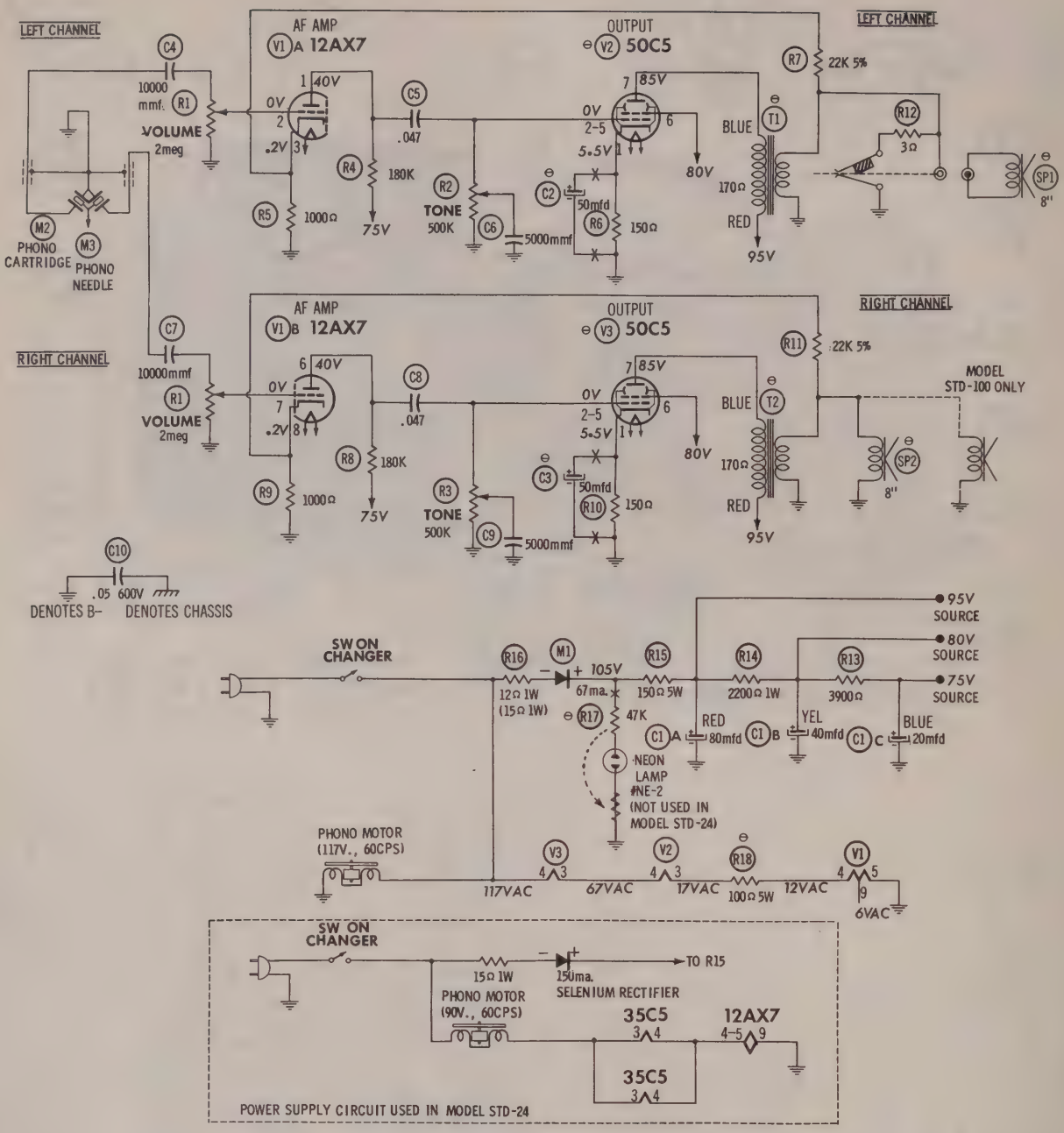
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†185K	0Ω	1000Ω	12Ω	0Ω	†185K	0Ω	1000Ω	6Ω
V2	50C5	150Ω	500K	110Ω	160Ω	500K	†2300Ω	†320Ω		
V3	50C5	150Ω	500K	160Ω	210Ω	500K	†2300Ω	†320Ω		

† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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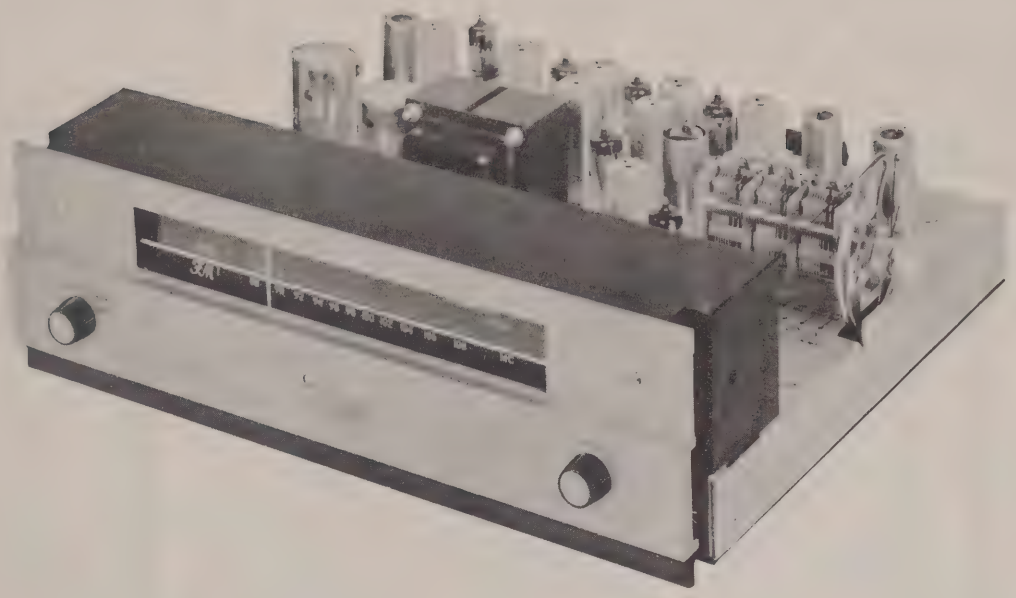
FANFARE MODELS
STD-24, STD-100, STD-442

PHOTOFACT® Folder

HARMAN-KARDON
MODELS MA-250, T-250

HARMAN-KARDON
MODELS MA-250, T-250



HARMAN-KARDON
MODELS MA-250, T-250

TRADE NAME	Harman-Kardon Model T-250 (The Ode) FM-AM Tuner; MA-250 Multiplex Adapter		
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.		
TYPE SET	AC Operated 12 Tube FM-AM Tuner and 4 Tube Multiplex Adapter		
POWER SUPPLY	105-125 Volts AC, 60 Cycles		
TUNING RANGE	BROADCAST 530 - 1650KC FREQ. MOD. 88 - 108MC	RATING	52 Watts, .51 Amp. @ 117 Volts AC 44 Watts, .44 Amp. @ 117 Volts AC (Tuner Only)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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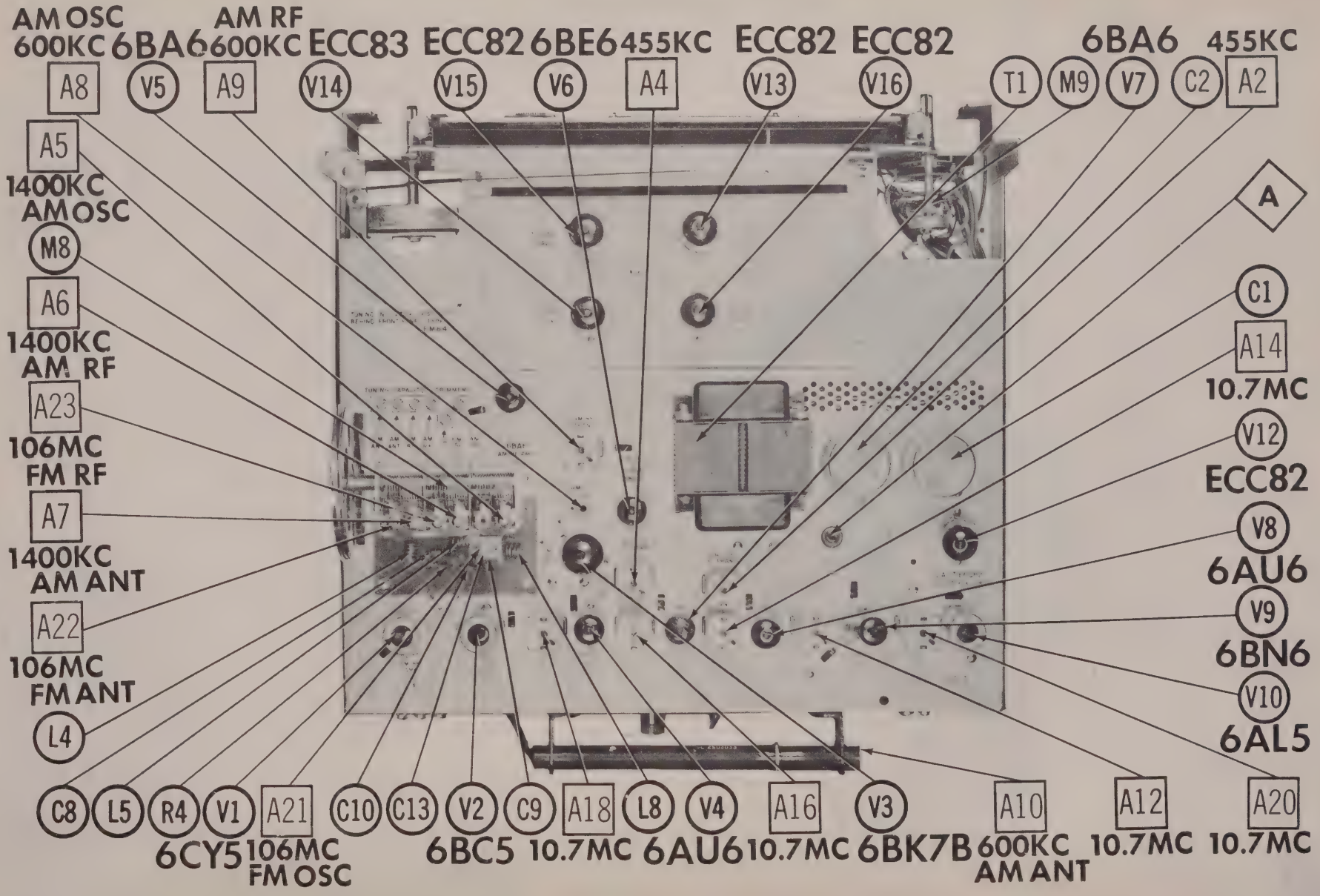
JL436

SET 471 FOLDER 7



CHASSIS TOP VIEW

TUNER ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
- A1 thru A4, A9, A11 thru A20 ..... GENERAL CEMENT #5097, 8727; WALSCO #2515
- A5, A6, A7, A21, A22, A23 ..... GENERAL CEMENT #5004, 5008, 5009; WALSCO #2520
- A8 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295; WALSCO #2526, 2543, 2544, 2545

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to AM RF stator lug (center section) of tuning gang. Low side to chassis.	455KC (400∿Mod.)	AM	Tuning gang fully open	AC probe to Output Jack. Common to chassis.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1400KC	"	1400KC	"	A5, A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	"	600KC	"	A8, A9, A10	Adjust for maximum output. Repeat step 2.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01mfd	High side to FM RF stator lug (center section) of tuning gang. Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point (A). Common to chassis.	A11, A12, A13, A14, A15, A16, A17, A18	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe thru 100K to point (B). Common to chassis.	A19	"
6.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01mfd	High side to FM RF stator lug (center section) of tuning gang. Low side to chassis.	10.7MC (450KC Swp.)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A11, A12, A13, A14, A15, A16, A17, A18	Adjust for maximum gain and symmetry of response similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. thru 100K to point (B). Low side to chassis.	A19	"
6.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A20	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A19 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	270Ω Carbon Resistor	Across FM antenna terminals with 270Ω in high side.	106MC (Unmod.)	FM	106MC	DC probe to point (A). Common to chassis.	A21, A22, A23	Adjust for maximum deflection.
8.	"	"	90MC	"	90MC	"	L8, L5, L4	Adjust for maximum deflection.

FIG. 1

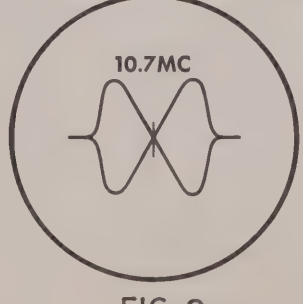


FIG. 2

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6CY5
V2	FM Mixer	6BC5
V3	FM Osc. - AFC	6BK7B
V4	1st FM IF Amplifier	6AU6
V5	AM RF Amplifier	6BA6
V6	AM Converter	6BE6
V7	2nd FM-AM IF Amplifier	6BA6
V8	3rd FM IF Amplifier	6AU6
V9	FM Limiter	6BN6
V10	Discriminator	6AL5
V11	Tuning Indicator	EM84
V12	Cathode Follower	ECC82 (12AU7) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	300	JE2502987	AFH4-02-10	D0022	FP419.5	TMD-56 TD-30-300	TVL-4580	
B	■65	300							
C	▲40	300							
C2A	▲50	200	JE2502988	AFH4-02-10	D0022	FP419.5	TMD-31 TD-50-450	TVL-4580	
B	■40	200							
C	▲40	200							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	1.5 10%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C4	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C5	10000		BPD-01	DD-203	BYA10S1	CCD-103	B-110	5HK-S10
C6	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C7	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C8	.47		NPO-SI .5	TCZ-R5				
C9	2.2		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C10	10 N750		N750-DI 10	DTZ-10	C10Q47U	CCTN-100	CN7-410	10TCU-Q10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13								
C14	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C15	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C16	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C17	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C18	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C19	600 10%	(47mmf) *		DD-601	1R5T6	CCS-621	GP360	5GA-T60
C20	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C24	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	2000		BPD-002	DD-202	BYA10D2	CCD-102	B-220	5HK-D20
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C29	2000		BPD-002	DD-202	BYA10D2	CCD-102	B-220	5HK-D20
C30	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C31	2000		BPD-002	DD-202	BYA10D2	CCD-102	B-220	5HK-D2
C32	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C33	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	2000							
C37	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C40	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C43	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C46	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C47	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

* Alternate

Note 1. Not used in some versions.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	1000Ω	
R2	33K	
R3	68Ω	
R4	3.3meg	
R5	10Ω	
R6	330Ω	
R7	22K	
R8	1000Ω	
R9	68Ω	
R10	1000Ω	
R11	2.2meg	
R12	330Ω	
R13	120Ω	
R14	1meg	
R15	1000Ω	
R16	68Ω	

ITEM No.	RATING	REMARKS
R17	1meg	
R18	1000Ω	
R19	22K	
R20	470K	
R21	330Ω	
R22	120Ω	
R23	100K	
R24	10K	
R25	120Ω	
R26	470K	
R27	2.2meg	
R28	100K	
R29	1meg	
R30	1.2meg	
R31	220K	
R32	3300Ω	

ITEM No.	RATING	REMARKS
R33	150K	
R34	1000Ω	
R35	22K	
R36	220Ω	
R37	10meg	
R38	470K	
R39	1meg	
R40	4700Ω	
R41	100K	
R42	1meg	
R43	4700Ω	
R44	100K	
R45	1000Ω 1W	
R46	1000Ω 1W	
R47	330Ω 1W	
R48	330Ω 1W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Harman-Kardon PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Antenna Coil	GLCOM3082						2uh
L2	RF Choke	GLCOM3083						
L3	RF Choke							3.3uh
L4	FM RF Coil							
L5	FM Mixer Coil							
L6	Fil. Choke							3.3uh
L7	Cathode Choke		19-1000	19-1000	BC-561	4602		1uh
L8	FM Osc. Coil							
L9	RF Choke							3.3uh
L10	Loopstick	GL2503033						
L11	AM RF Trans.	GT2503049						
L12	AM Osc. Coil	GL2503068	14-1055	14-1055	BC-393			
L13	1st FM IF Trans.	GT2503045	16-3487	16-3487	FM-254	1463		
L14	1st AM IF Trans.	GT2503050	16-6758	16-6758	BC-352	12-C1	RF-1	
L15	2nd FM IF Trans.	GT2503045	16-3487	16-3487	FM-254	1463		
L16	2nd AM IF Trans.	GT2503051	16-6758	16-6758	BC-353	12-C2	RF-2	
L17	3rd FM IF Trans.	GT2503045	16-3487	16-3487	FM-254	1463		
L18	4th FM IF Trans.	GT2503045	16-3487	16-3487	FM-254	1463		
L19	Fil. Choke							3.3uh
L20	Discriminator	GR2503052	17-3494	17-3494	FM-253	1464		
L21	Fil. Choke							3.3uh
L22	Fil. Choke							3.3uh
L23	Fil. Choke							3.3uh

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA
K1	FM AFC Network	470mmf, 10000mmf, 10000mmf, 47Ω, 470K, 1meg	PCCOM3080	Sprague V-21
K2	AM Det. RF Filter	150mmf, 150mmf, 47K	PC781599	Aerovox PA-98 Centralab PC-51 Cornell-Dubilier 111TM2 Sprague D-2
K3	10KC Filter Network	100mmf, 100mmf, 200mmf, 82K, 150K, 150K	PCCOM2927	Sprague TC-19
K4	Discriminator Network	100mmf, 2000mmf, 10000mmf, 22K, 180K, 180K, 1meg	PCCOM3081	Sprague C-8

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .51A	225VCT @ .070A	6.3V @ 3.7A	FTCOM2989						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ .6A	6.3V @ .6A								

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.073A	Z1362133 ①	1234AH ①	RS065 ①	65 ①	SR-200 ②	① Selenium Type
M2	.073A	Z1362133 ①	1234AH ①	RS065 ①	65 ①	SR-200 ②	
M3	.073A	Z1362133 ①	1234AH ①	RS065 ①	65 ①	SR-200 ②	
M4	.973A	Z1362133 ①	1234AH ①	RS065 ①	65 ①	SR-200 ②	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Harman-Kardon PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M5	3AG	1½A 250V	ECOM2953		312015 (3AG 1½A 250V)	342001	AGC1½	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Harman-Kardon PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M6	1N541		1N636	1N60	1N295	AM Detector (Pigtail)
M7	1N541		1N636	1N60	1N295	Tuning Indicator Rectifier (Pigtail)

MISCELLANEOUS

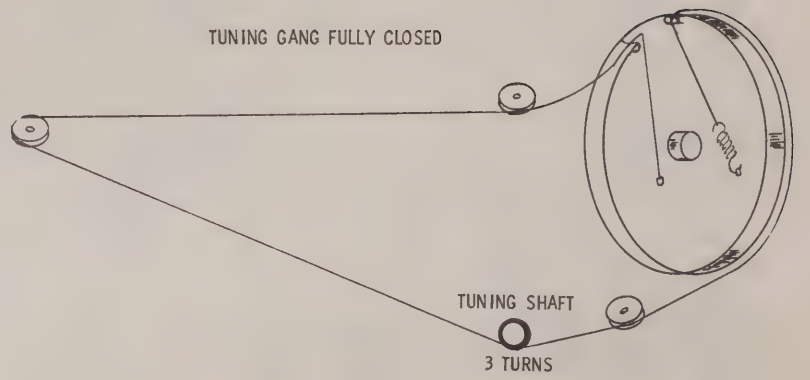
ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M8	Tuning Cap.	JV2503008	5 Gang
M9	Switch	ER2502997	Function, (Rotary Type)

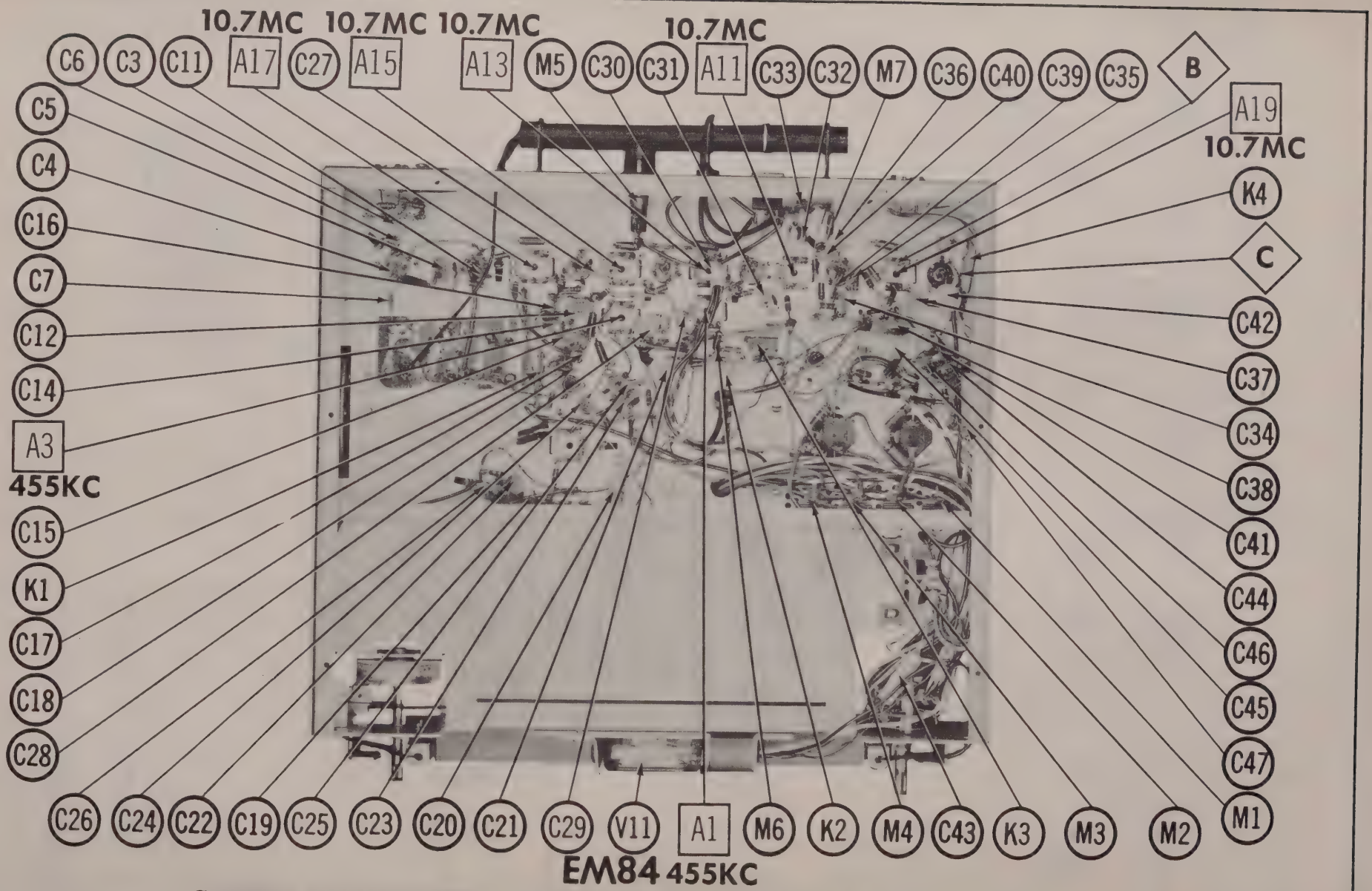
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

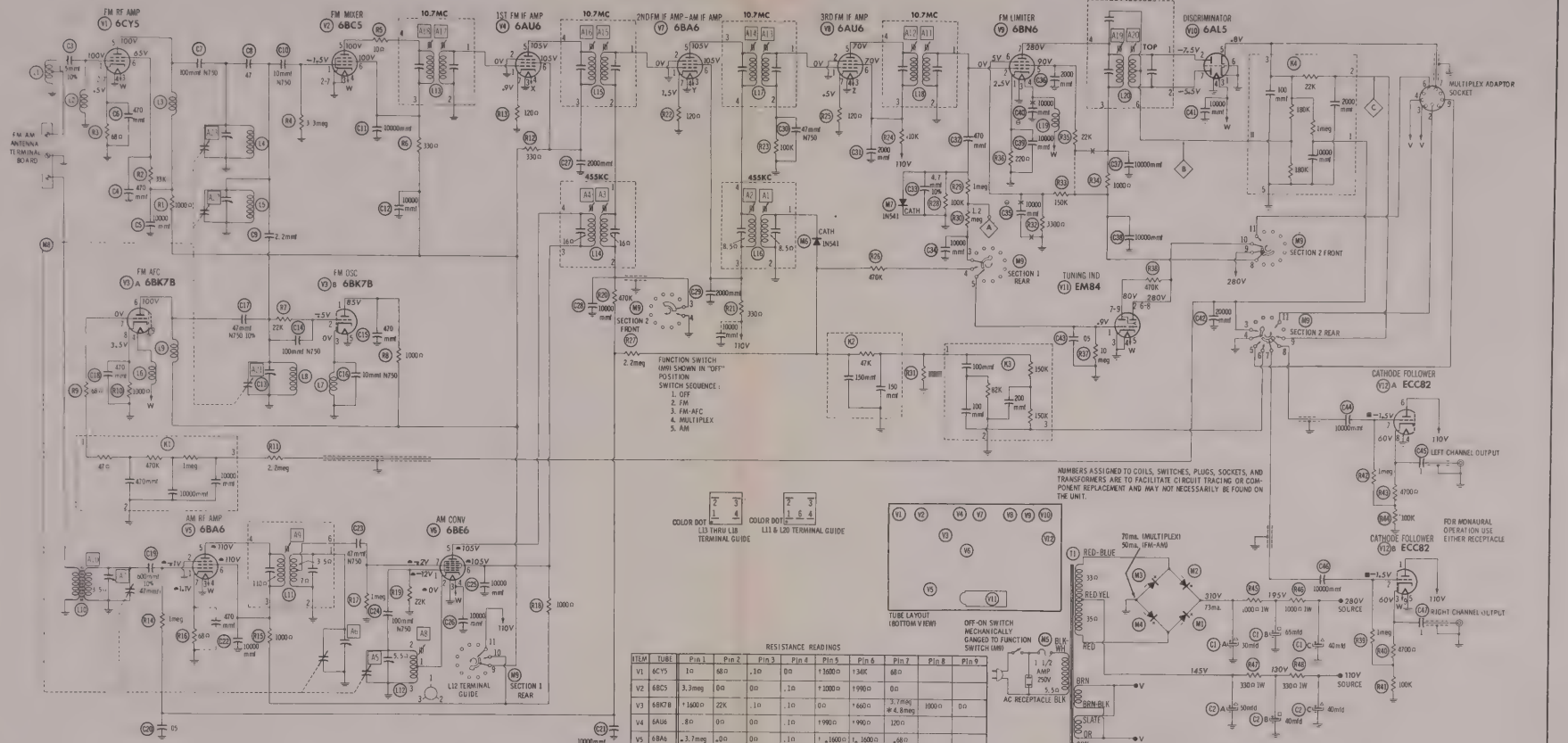
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

DIAL CORD STRINGING





CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CY5	1Ω	68Ω	.1Ω	0Ω	†1600Ω	†34K	68Ω		
V2	6BC5	3.3meg	0Ω	0Ω	.1Ω	†1000Ω	†990Ω	0Ω		
V3	6BK7B	†1600Ω	22K	.1Ω	.1Ω	0Ω	†660Ω	3.7meg ⊕ 4.8meg	1000Ω	0Ω
V4	6AU6	.8Ω	0Ω	0Ω	.1Ω	†990Ω	†990Ω	120Ω		
V5	6BA6	▲3.7meg	▲0Ω	0Ω	.1Ω	†▲1600Ω	†▲1600Ω	▲68Ω		
V6	6BE6	▲22K	▲.7Ω	0Ω	.1Ω	†▲1600Ω	†▲1600Ω	▲1meg		
V7	6BA6	17Ω ▲2.8meg	0Ω	.1Ω	0Ω	†1000Ω	†990Ω	120Ω		
V8	6AU6	100K	0Ω	.1Ω	0Ω	†10K	†10K	120Ω		
V9	6BN6	22Ω	.9Ω	0Ω	.1Ω	††25K	330Ω	††3000Ω		
V10	6AL5	0Ω	180K	.1Ω	0Ω	300K	0Ω	180K		
V11	EM84	2meg	†† 2000Ω	0Ω	0Ω	.1Ω	††2000Ω	††470K	††2000Ω	††470K
V12	ECC82 12AU7	†660Ω	1.1meg	105K	0Ω	0Ω	†660Ω	1.1meg	105K	.1Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
▲ MEASURED IN "AM" POSITION.
† MEASURED FROM JUNCTION OF R47 AND C2A.
†† MEASURED FROM OUTPUT OF M1 AND M2.
⊕ MEASURED FROM PIN 3 OF V12.
* MEASURED FROM PIN 8 OF V12.
* MEASURED IN "FM-AFC" POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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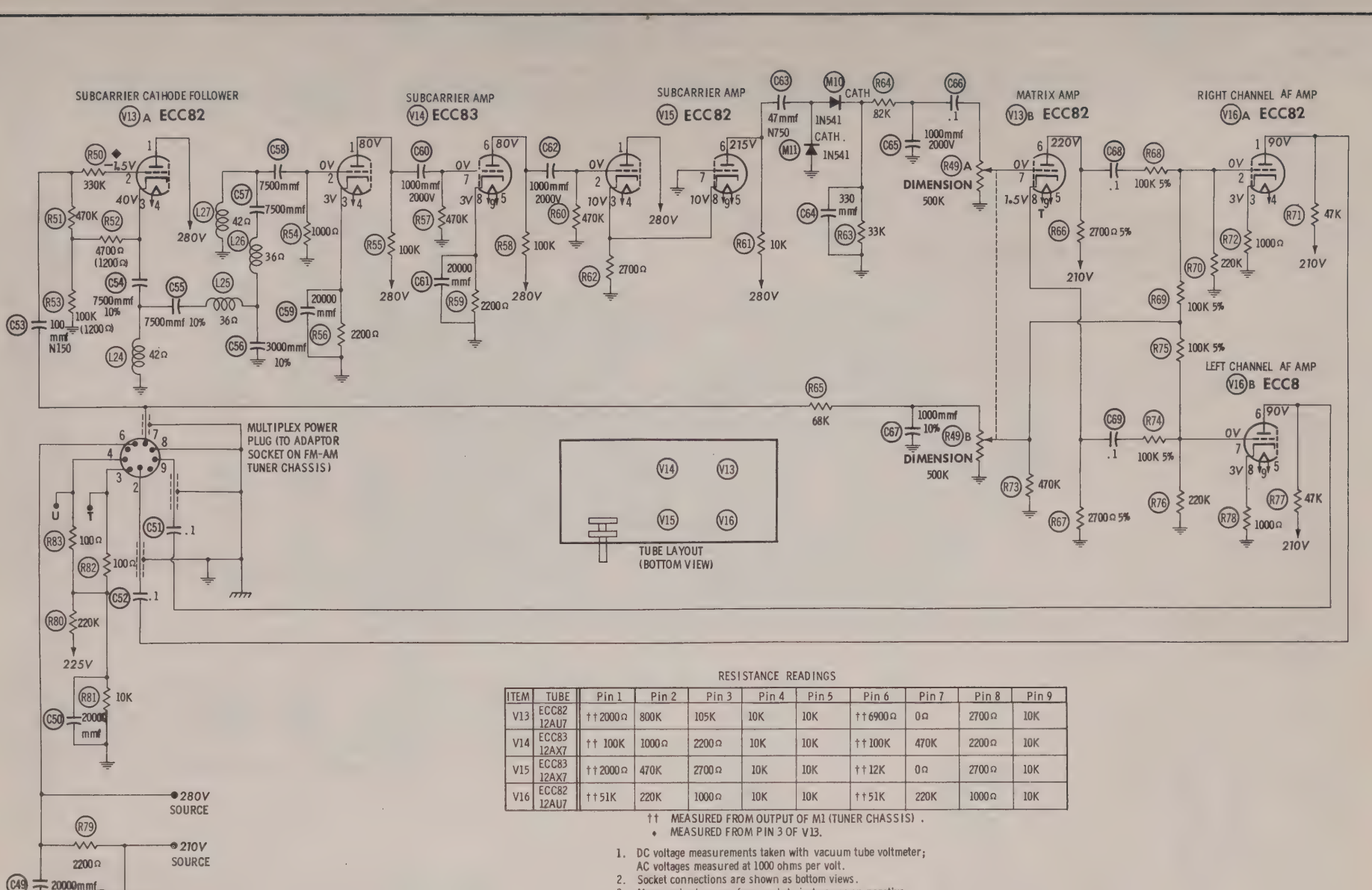
HARMAN-KARDON
MODELS MA-250, T-250



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V13	ECC82 12AU7	††2000Ω	800K	105K	10K	10K	††6900Ω	0Ω	2700Ω	10K
V14	ECC83 12AX7	†† 100K	1000Ω	2200Ω	10K	10K	†† 100K	470K	2200Ω	10K
V15	ECC83 12AX7	††2000Ω	470K	2700Ω	10K	10K	†† 12K	0Ω	2700Ω	10K
V16	ECC82 12AU7	††51K	220K	1000Ω	10K	10K	††51K	220K	1000Ω	10K

†† MEASURED FROM OUTPUT OF M1 (TUNER CHASSIS) .
♦ MEASURED FROM PIN 3 OF V13.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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HARMAN-KARDON
MODELS MA-250, T-250

HARMAN-KARDON
MODELS MA-250, T-250

AMP PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V13	Sub Carrier Cathode Follower-Matrix Amplifier	ECC82 (12AU7) *
V14	Sub Carrier Amplifier	ECC83 (12AX7) *
V15	Sub Carrier Amplifier	ECC82 (12AU7) *
V16	Left Channel AF Amp. - Right Channel AF Amp.	ECC82 (12AU7) *

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C48	10	350		PRS1620	BR1045	TC62	TD-10-450	TVA-1604	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C49	20000			BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C50	20000			BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C51	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C52	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C53	100	N150					*		10TCP-T10
C54	7500	10%		DI-7500			6DP-2-752	MCB471	10TS-D75
C55	7500	10%		DI-7500			6DP-2-752	MCB471	10TS-D75
C56	3000	10%		DI-3000		PM6D3	CCS-302	MCB461	10TS-D30
C57	7500			DI-7500	DD-752	HVE16D75	6DP-2-752	GP275	10TS-D75
C58	7500			DI-7500	DD-752	HVE16D75	6DP-2-752	GP275	10TS-D75
C59	20000			BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	1000	2000V		HVD-30-1000	DD30-102	HVB20D1		2HV-210	30GA-D10
C61	20000			BPD-01	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C62	1000	2000V		HVD-30-1000	DD30-102	HVB20D1		2HV-210	30GA-D10
C63	47	N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C64	330			BPD-00033	DD-331	L10T33	CCD-331	B-333	5GA-T33
C65	1000	2000V		HVD-30-1000	DD30-102	HVB20D1		2HV-210	30GA-D10
C66	.1	200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C67	1000	10%			DD-102	PM6D1	CCS-102	GP210	10TS-D10
C68	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C69	.1	400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R49A	500K	½	RV2643138					Dimension
B	500K	½						Dimension

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R50	330K	
R51	470K	
R52	4700Ω	
R53	100K	
R54	1000Ω	
R55	100K	
R56	2200Ω	
R57	470K	
R58	100K	
R59	2200Ω	
R60	470K	
R61	10K	

ITEM No.	RATING	REMARKS
R62	2700Ω	
R63	33K	
R64	82K	
R65	68K	
R66	2700Ω 5%	
R67	2700Ω 5%	
R68	100K 5%	
R69	100K 5%	
R70	220K	
R71	47K	
R72	1000Ω	

ITEM No.	RATING	REMARKS
R73	470K	
R74	100K 5%	
R75	100K 5%	
R76	220K	
R77	47K	
R78	1000Ω	
R79	2200Ω	
R80	220K	
R81	10K	
R82	100Ω	
R83	100Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Harman-Kardon PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L24	RF Choke							4MH
L25	RF Choke							1.6MH
L26	RF Choke							1.6MH
L27	RF Choke							4MH

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Harman-Kardon PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M10	1N541		1N60	1N60	1N295	Multiplex Det. (Pigtail)
M11	1N541		1N60	1N60	1N295	Multiplex Det. (Pigtail)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	PCOM2865	Function, Tuning
Dial Glass	P2503000	

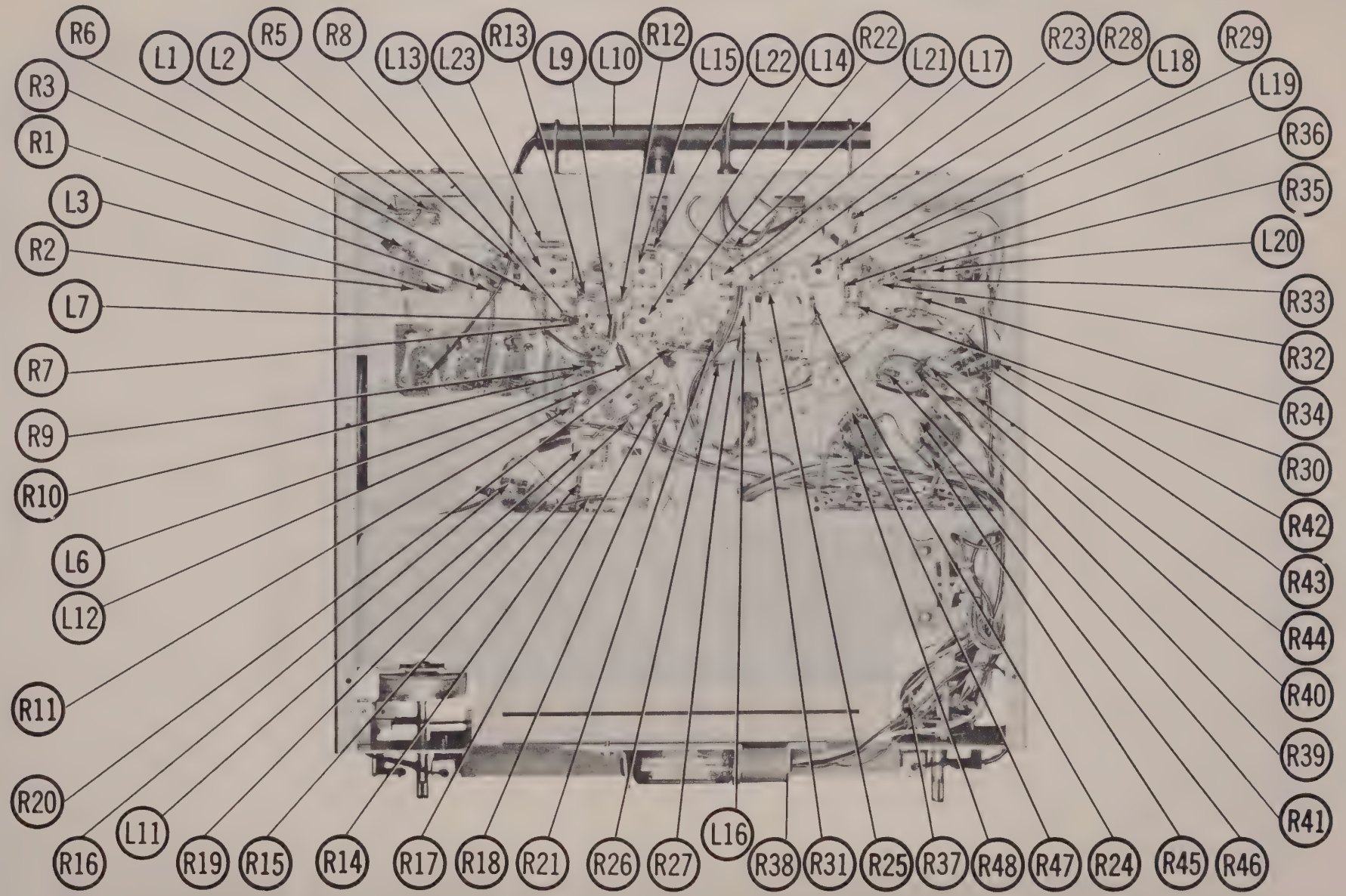
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

AMP CHASSIS BOTTOM VIEW

HARMAN-KARDON
MODELS MA-250, T-250



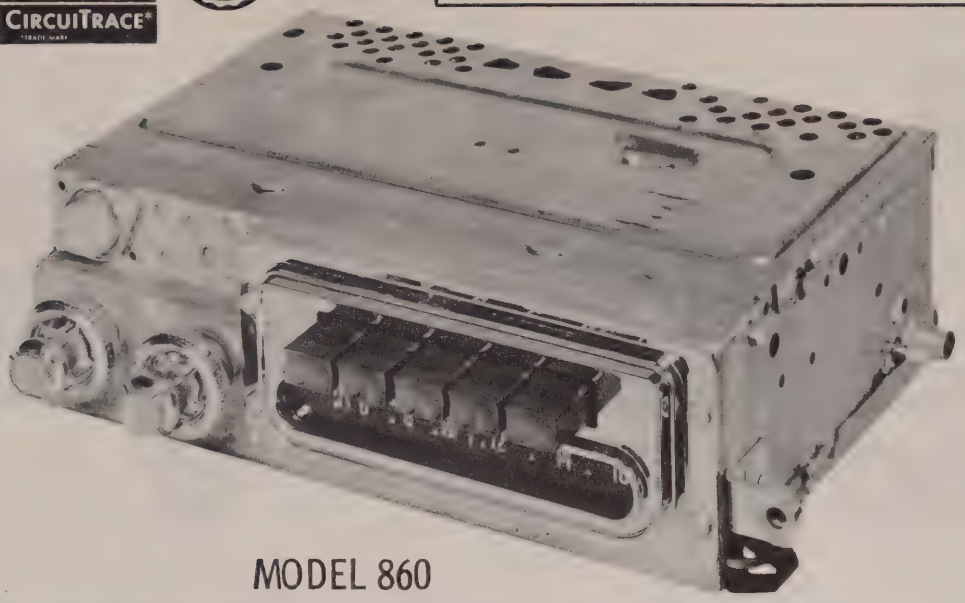
TUNER CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER

MOPAR MODELS 860, 861

MOPAR
MODELS 860, 861



MODEL 860

TRADE NAME	Mopar Models 860 (For 1959 MP1 & MP2 Plymouth Automobiles), 861(For 1959 Chrysler Export Model Autos)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd. Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube Custom Built Automobile AM Receiver With Transistorized Output
POWER SUPPLY	12 Volt Storage Battery
RATING	1.3 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST	540— 1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

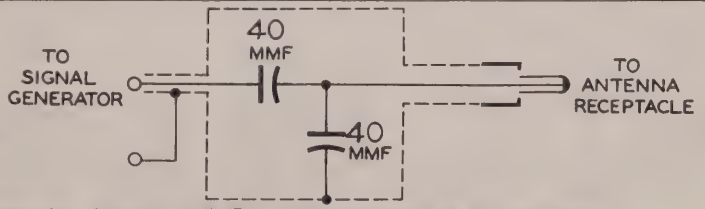
Suggested alignment tools:
A1 thru A4.....GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545
A5, A6.....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8 thru A11.....GENERAL CEMENT #9050L, 9150
WALSCO #2521

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna receptacle. Low side to chassis.	262.5KC (400∿ Mod.)	High frequency end stop	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1.	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, A10) 1 3/8" out of coils. Repeat Step 2.						
3.	Fig. 1.	Thru dummy to antenna receptacle.	1020KC	Tuner carriage 49/64th" in from high end stop.	Across voice coil	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3 until no further improvement is noted. Cement cores.
4.	"	"	1925KC	Tune to 1400KC Signal	"	A11	Adjust for MINIMUM output.

With radio tuned to a 1000KC signal, adjust pointer adjustment so that pointer coincides with 1000KC on dial.
With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust for maximum output.

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press button in firmly.
4. Repeat for remaining pushbuttons.



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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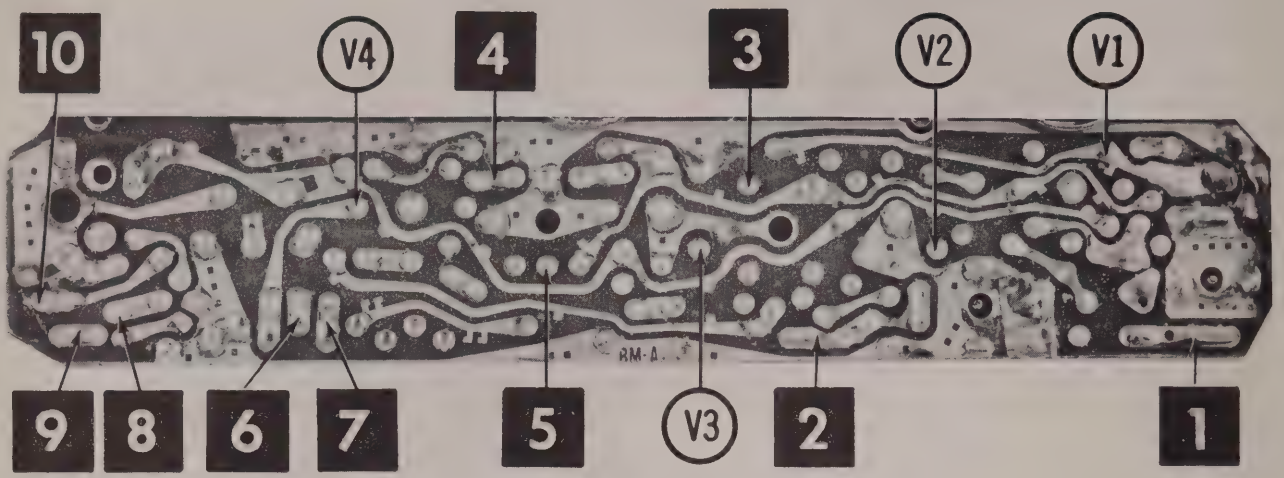
JL468

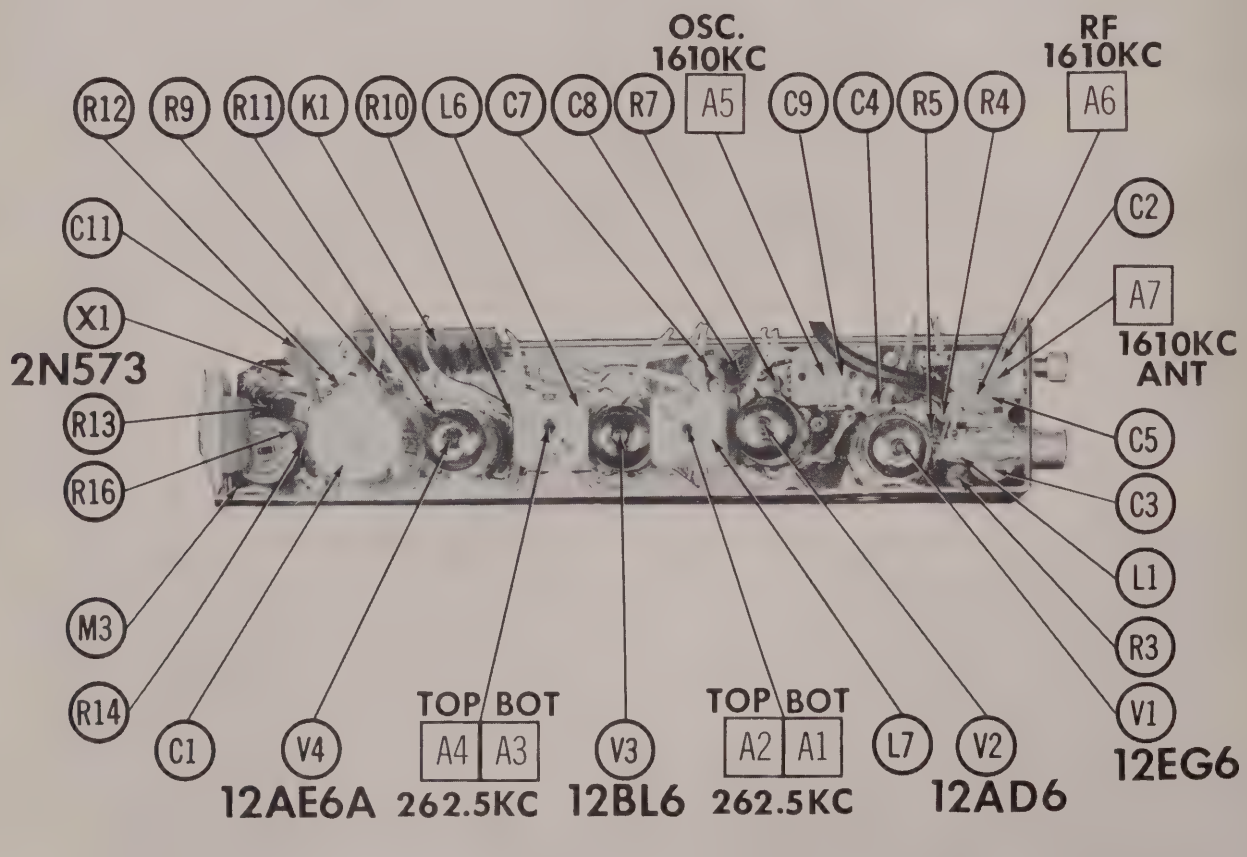
SET 471 FOLDER 8



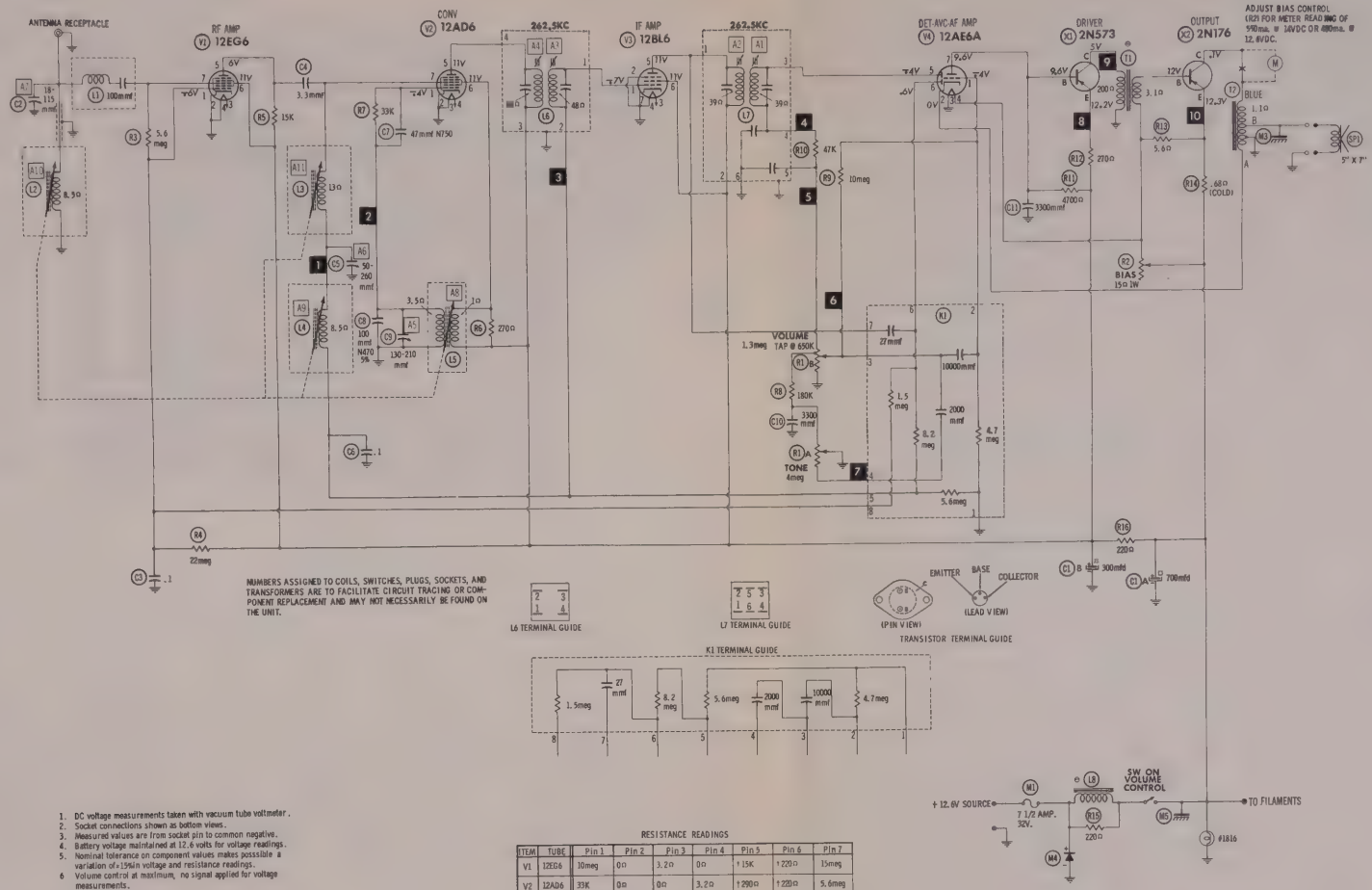
A Howard W. Sams CIRCUITRACE* Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



PRINTED BOARD — TOP VIEW



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12EG6	10meg	0Ω	3.2Ω	0Ω	†15K	†220Ω	15meg
V2	12AD6	33K	0Ω	0Ω	3.2Ω	†290Ω	†220Ω	5.6meg
V3	12BL6	5.5meg	0Ω	3.2Ω	0Ω	†280Ω	†220Ω	0Ω
V4	12AE6A	3.5meg	.4Ω	0Ω	3.2Ω	1meg	2meg	¶

TRANSISTOR CIRCUIT RESISTANCE NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF C1A AND R16
¶ READING WILL VARY DEPENDING ON INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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MOPAR MODELS 860, 861

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	RF Amplifier	12EG6
V2	Converter	12AD6
V3	IF Amplifier	12BL6
V4	Det. AVC-AF Amp.	12AE6A

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N573	Driver	2N155	2N176	2N573	2N176	PNP
X2	2N176	Output					PNP Note 1

Note 1. When replacing, apply DC-4 grease (Part #11M490487) or equivalent to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■700	16	23K561580	PWH2-02-60		PWP200.4		PCLS-2179 *	
B	▲300	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	18-115	#20K542026				302		
C3	.1 100V		P215IN-1	DF-104	BC2P1J	1DP-2-104	ACE401	2SE-P10
C4	3.3		NPO-SI 3.3	TCZ-3R3		CCTO-3R3	CNO-533	10TCC-V33
C5	50-260	#20K5611324				427		
C6	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	CUB2P1
C7	47 N750		N750-DI 47	DTZ-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C8	100 N470 5%	#21R129366				*		
C9	130-210	#20B5611323						
C10	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C11	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	4meg	1/2	18B561364	F1-82	RTV-687	◆ QJ-1193A		Tone
B	1.3meg	1/2		R2-60	Not Req.			Volume
	650K Tap			AK-28 (Shaft)				
C	Switch			KR-4	Not Req.			Power Off-On
R2	15Ω	1(WW)	18K561139				PFL-15	Bias

◆ "Concentrikit" Equivalent: K-8 Kit with base elements & shafts: B11-240, P13-022 (Panel), B19-137X, R1-103 (Rear), S-37 (Bushing), 76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	5.6meg	
R4	22meg	
R5	15K	
R6	270Ω	
R7	33K	

ITEM No.	RATING	REMARKS
R8	180K	
R9	10meg	
R10	47K	
R11	4700Ω	
R12	270Ω	

ITEM No.	RATING	REMARKS
R13	5.6Ω	#17K739323
R14	.68Ω(Cold)	#17A561516
R15	220Ω	
R16	220Ω	

\# Motorola Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Ant. Coil	24K560921 *						
L2	Ant. Coil	24C536308 †						
L3	Image Trap Coil	24K561734 †						
L4	RF Coil	24C536308 †						
L5	Osc. Coil	24B536300 †						
L6	Input IF	24K561842	16-6756	16-6756	BC-344	13-PH1		
L7	Output IF	24K561843	16-6757	16-6757	BC-346	13-PH6		

* Includes 100mmf cap.
† Part of M2.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L8	1.1A	.3Ω	.007 HY	25K561570①						

① Alternate Part #25C561569

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	15	1	25K561573①						① Alternate Part #25K561439

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	16Ω	Tap ⓐ 3-4Ω	25C561407							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3-4Ω	50D542099	57A21	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Audio Coupling	27mmf, 2000mmf, 10000mmf, 1.5meg, 4.7meg, 5.6meg, 8.2meg	51B561099	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V	65R122346	9K561634	30707.5 (SFE 7½ 32V)	155009	SFE 7½	HDH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77E560977	Complete (AT-243)
M3	Spark Plate	64K561877	1" x 1 3/8"
M4	Spark Plate	48K539953	Selenium
M5	Spark Plate Printed Board	84K561587	Less All Components (Specify Suffix Letter)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C560839	Tuning, Volume
Knob	36C560828	Tone, Dummy
Pushbutton	38K562347	Black
Pushbutton	38B560858	Metallic Gray
Dial Pointer	1B560951	
Dial Crystal	61B560859	
Escutcheon	1V561422	(Includes Dial Scale Crystal)

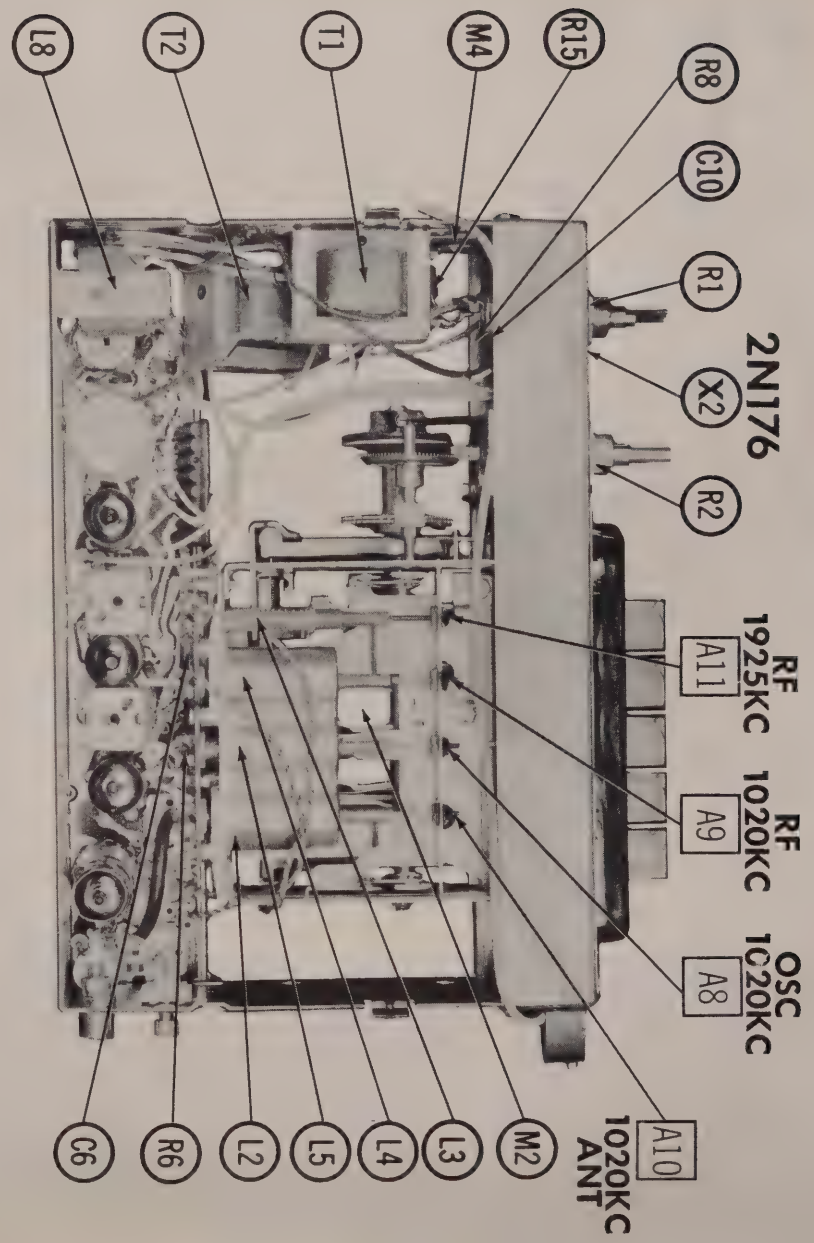
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Shielded Hook-up Wire ..... Use BELDEN No. 8885

Bonding Strap ..... Use BELDEN No. 8661

CHASSIS—TOP VIEW

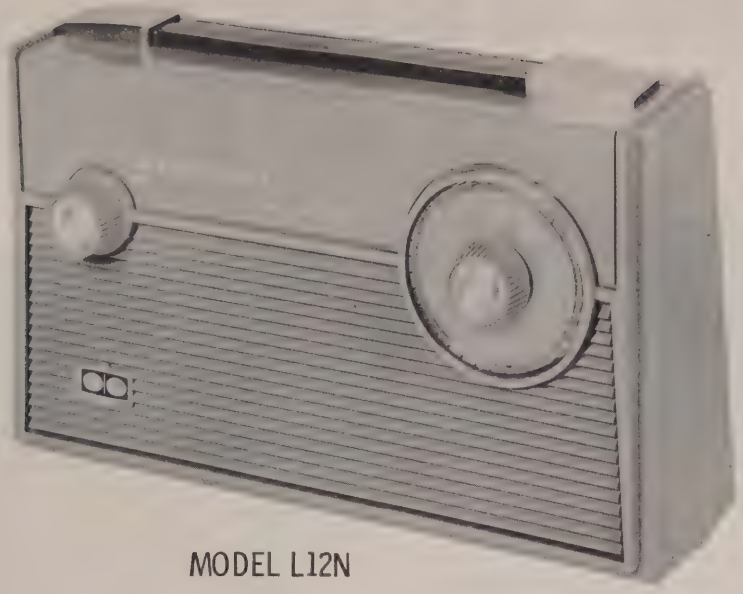


PHOTOFACT® Folder with CIRCUITRACE*

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA MODELS L12G, L12N (Ch. HS-728)

MOTOROLA MODELS
L12G, L12N (Ch. HS-728)



MODEL L12N

MOTOROLA MODELS
L12G, L12N (Ch. HS-728)

TRADE NAME	Motorola Models L12G, L12N (CH. HS-728)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	535 - 1620KC
RATING	9MA@9 Volts DC (No Signal, Min. Volume) 14MA@9 Volts DC (Signal, Normal Operation)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3,.....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531
A4.....	GENERAL CEMENT #8282, 8606, 8606L, 9295 WALSCO #2526, 2543, 2544, 2545
A5, A6.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	535KC	Tuning gang fully closed.	"	A4	"
3.		"	1620KC	Tuning gang fully open.	"	A5	Adjust for maximum output. Repeat Steps 2 & 3 until oscillator covers required range.
4.		"	1400KC	Tune to 1400KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang

DISASSEMBLY INSTRUCTIONS

1. Loosen 2 back panel mounting screws. Remove panel. (If necessary press on bottom center edge to swing panel free.)
2. Remove 2 screws from under batteries. Remove cabinet back.
3. Remove volume and tuning knobs.
4. Remove nut holding volume control.
5. Remove nut holding earphone jack.
6. Remove 2 chassis mounting screws from front of cabinet.
7. Unsolder chassis leads. Remove chassis.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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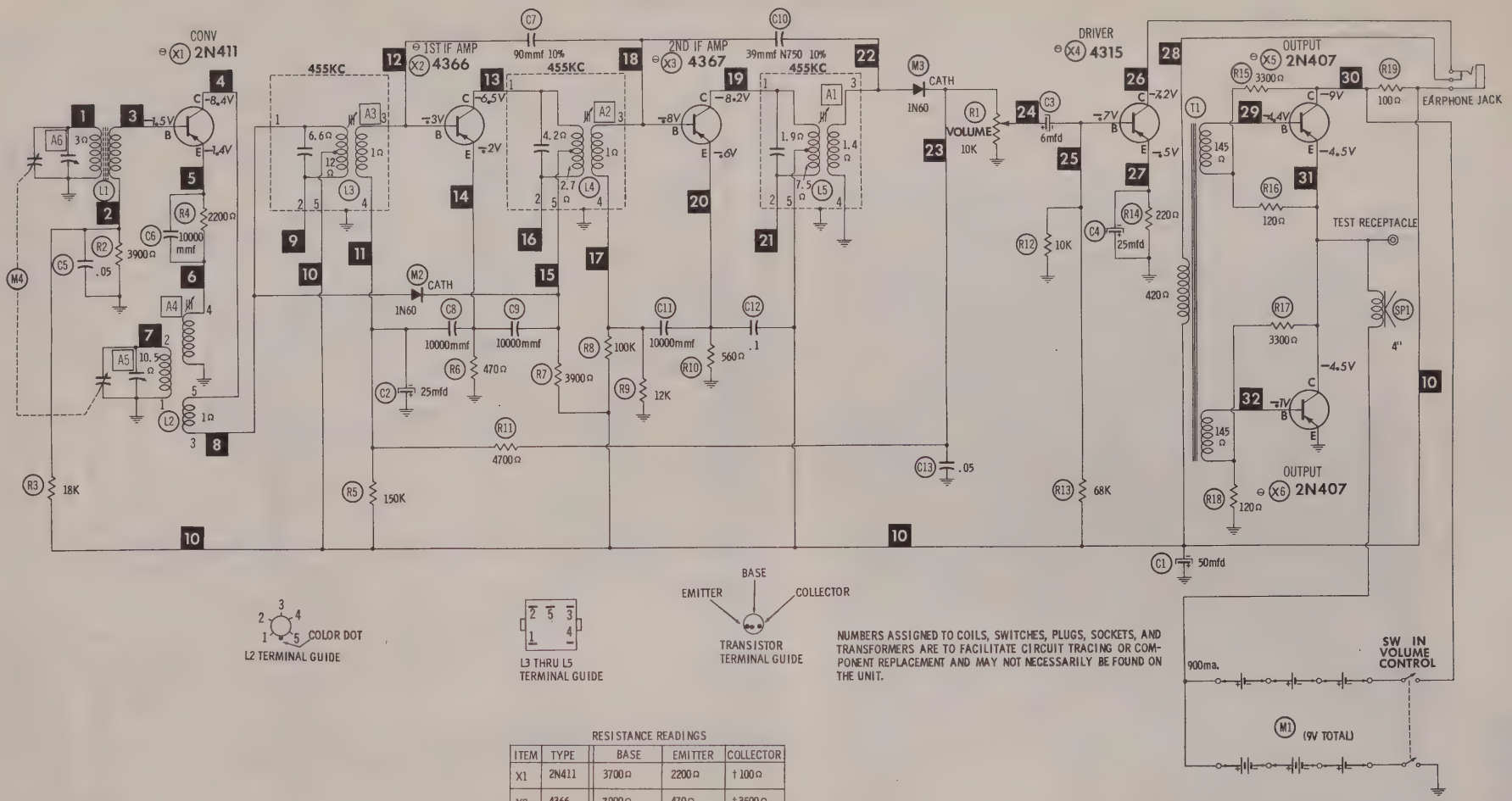
JF464



L2 TERMINAL GUIDE

L3 THRU L5 TERMINAL GUIDE

TRANSISTOR TERMINAL GUIDE

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N411	3700Ω	2200Ω	†100Ω
X2	4366	7000Ω	470Ω	†3500Ω
X3	4367	10K	560Ω	†100Ω
X4	4315	9000Ω	220Ω —	†520Ω
X5	2N407	†3300Ω	†3400Ω	†0Ω
X6	2N407	265Ω	0Ω	†3400Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R15 AND R19.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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MOTOROLA MODELS L12G, L12N (Ch. HS-728)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N411①	Converter		2N411	2N486	2N411	PNP
X2	4366②	1st IF Amplifier		2N409	2N483	2N409	PNP
X3	4367②	2nd IF Amplifier		2N409	2N483	2N409	PNP
X4	4315③	Driver		2N407	2N633	2N407	PNP
X5	2N407④	Output		2N407	2N633	2N407	PNP } Matched
X6	2N407④	Output		2N407	2N633	2N407	PNP } Pair

①Alternate Type 2N486 (B) ③Alternate Type 2N362 (B)
②Alternate Type 2N483 (B) ④Alternate Type 2N633 (B)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	50	15	23K643463	BCD15050	ECPA415	PET1475	ML50-15	VL-1174	
C2	25	10	23K642709	XPP-10025	NL25-10	TT10X25	ML30-15	TE-1118	
C3	6	10	23K636769	XPP-10006	NLW6-15	TT12X5	ML6-15	TE-1085	
C4	25	6	23K636454	XPP-6025	NLW25-6	TT6X25	ML30-6	TE-1091	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.05 200V		P288N-05	DF-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	90 10%			TCZ-91	L10Q91	CCD-101		10TS-991
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	39 N750 10%			TCN-39	C10Q39U	CCTN-390	CN7-439	10TCU-Q39
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.1 50V		P288N-1	DF-104	CUB2P1	10P-2-104	GEM-201	2TM-P1
C13	.05 200V		P288N-05	DF-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	½	18B643549					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	3900Ω	
R3	18K	
R4	2200Ω	
R5	150K	
R6	470Ω	
R7	3900Ω	

ITEM No.	RATING	REMARKS
R8	100K	
R9	12K	
R10	560Ω	
R11	4700Ω	
R12	10K	
R13	68K	

ITEM No.	RATING	REMARKS
R14	220Ω	
R15	3300Ω	
R16	120Ω	
R17	3300Ω	
R18	120Ω	
R19	100Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	24K643464						
L2	Osc. Coil	24B643467						
L3	1st IF Trans.	24D643556						
L4	2nd IF Trans.	24K643557						
L5	3rd IF Trans.	24K643558						

PRINTED BOARD

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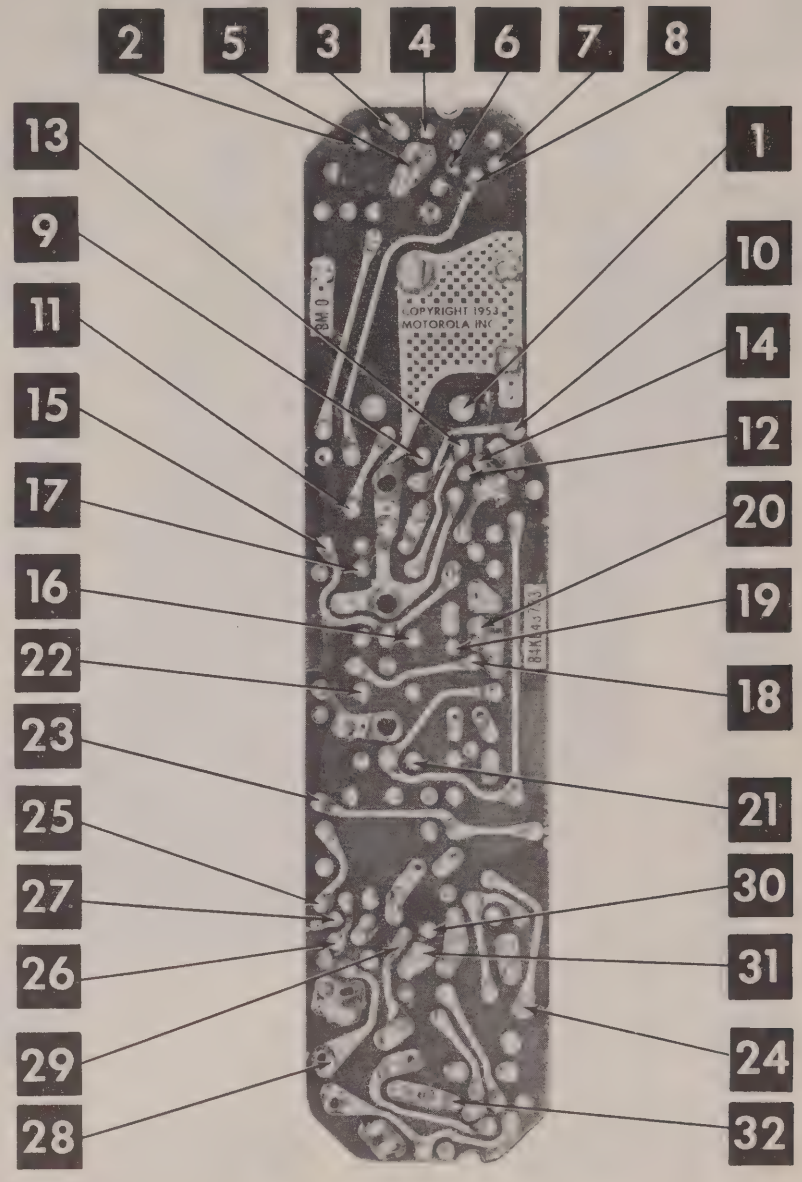


PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2	1 SEC. 2 1	25K642937						

SPEAKER

ITEM No.	TYPE SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	4"	PM	35-37Ω	50C643465	4A07Z36	

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V			1		635		M-14R	6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N60	48K640754	1N60	1N60	1N60	Overload & AVC (Pigtail)
M3	1N60	48K640754	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Cap Printed Board	19B643540 84K643733	2 Gang Less All Components

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

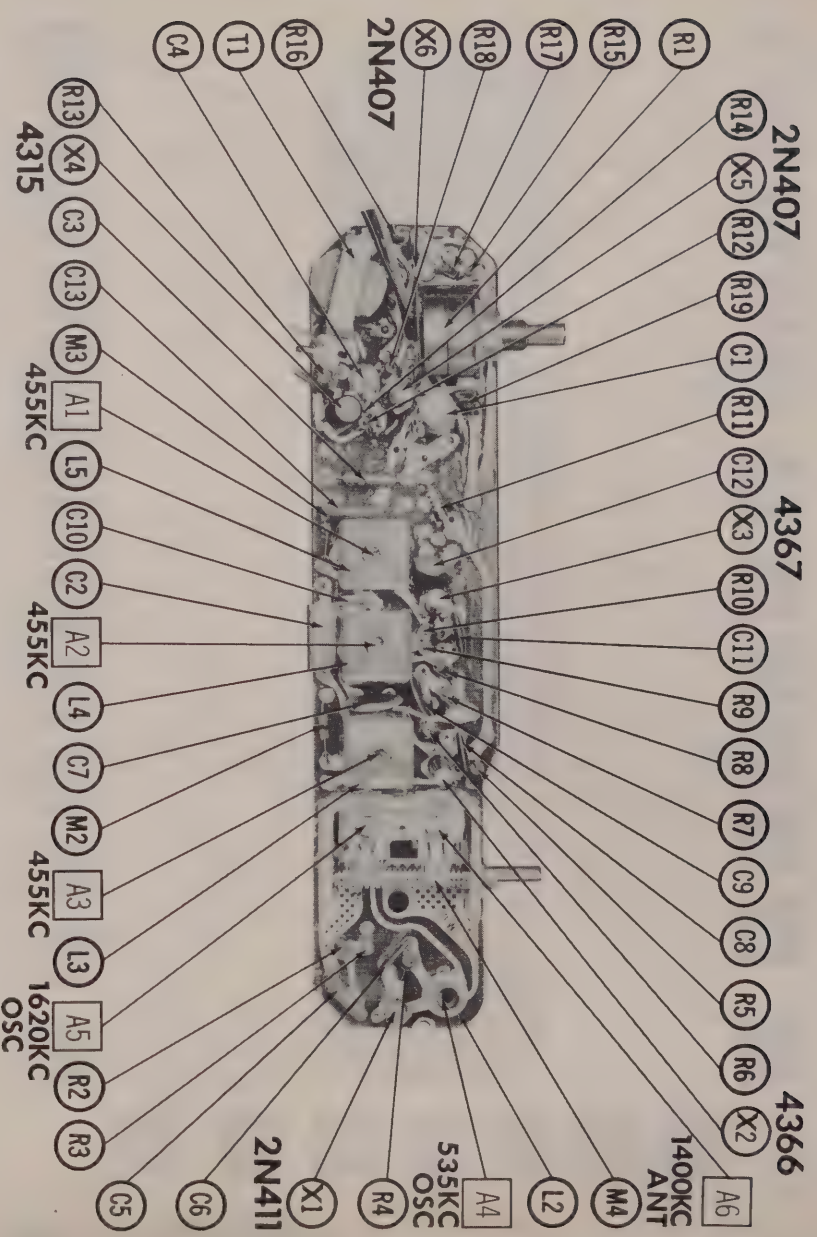
NAME	PART NO.	DESCRIPTION
Knob	36C643625	Tuning L12N
Knob	36K643629	Tuning L12G
Knob	36K643638	Volume L12N
Knob	36K643637	Volume L12G
Cabinet Back	1V643644	Model L12N
Cabinet Back	1V643641	Model L12G
Cabinet Front	1V643643	Model L12N Includes Medallion
Cabinet Front	1V643640	Model L12G Includes Medallion
Handle	55A643471	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

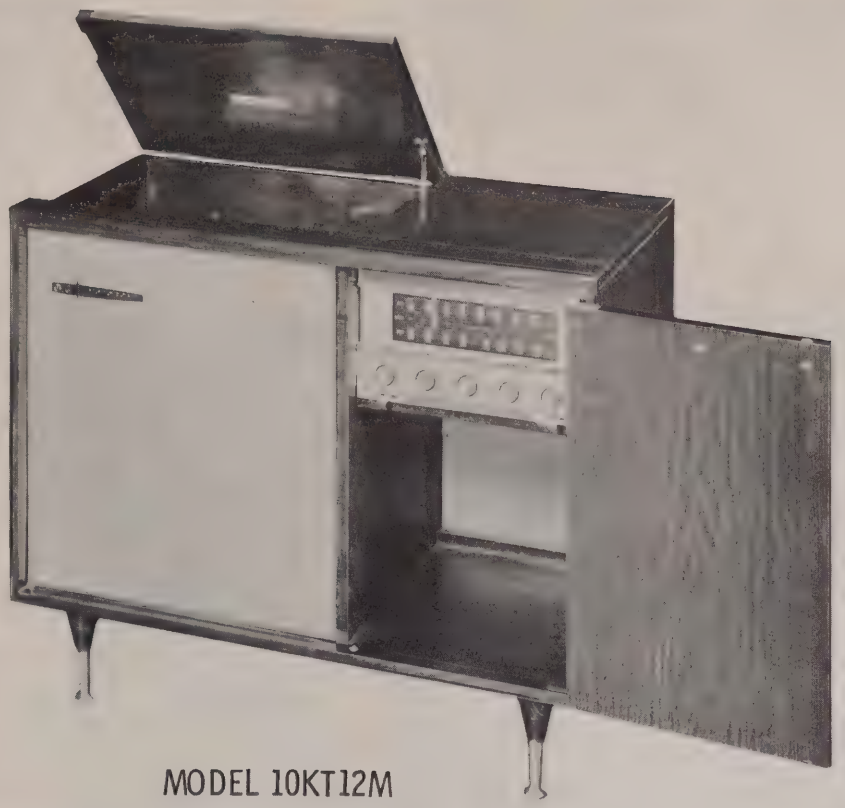
CHASSIS—TOP VIEW



PHOTOFACT® Folder

MOTOROLA MODELS
10KT12B, M, W (Ch. HS-674A, B, C)

MOTOROLA MODELS
10KT12B, M, W (Ch. HS-674A, B, C)

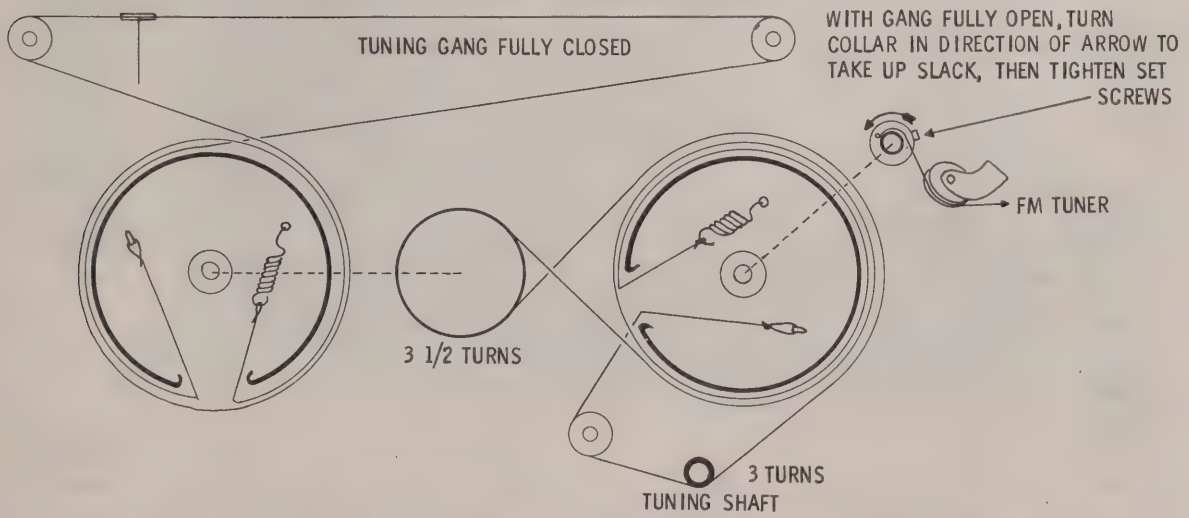


MODEL 10KT12M

TRADE NAME	Motorola Models 10KT12B, 10KT12M, 10KT12W (CH. HS-674A, B, C)		
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	AC Operated 10 Tube FM-AM Receiver With 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	79 Watts, .77 Amp. @117 Volts AC (Less Phono)
TUNING RANGE—BROADCAST	535 - 1620KC	FREQ. MOD.	88—108MC

FOR SERVICE INFORMATION ON RECORD CHANGER VM17RC - SEE SIMILAR V-M1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING


TUNING GANG FULLY CLOSED
WITH GANG FULLY OPEN, TURN COLLAR IN DIRECTION OF ARROW TO TAKE UP SLACK, THEN TIGHTEN SET SCREWS
FM TUNER
3 1/2 TURNS
3 TURNS
TUNING SHAFT

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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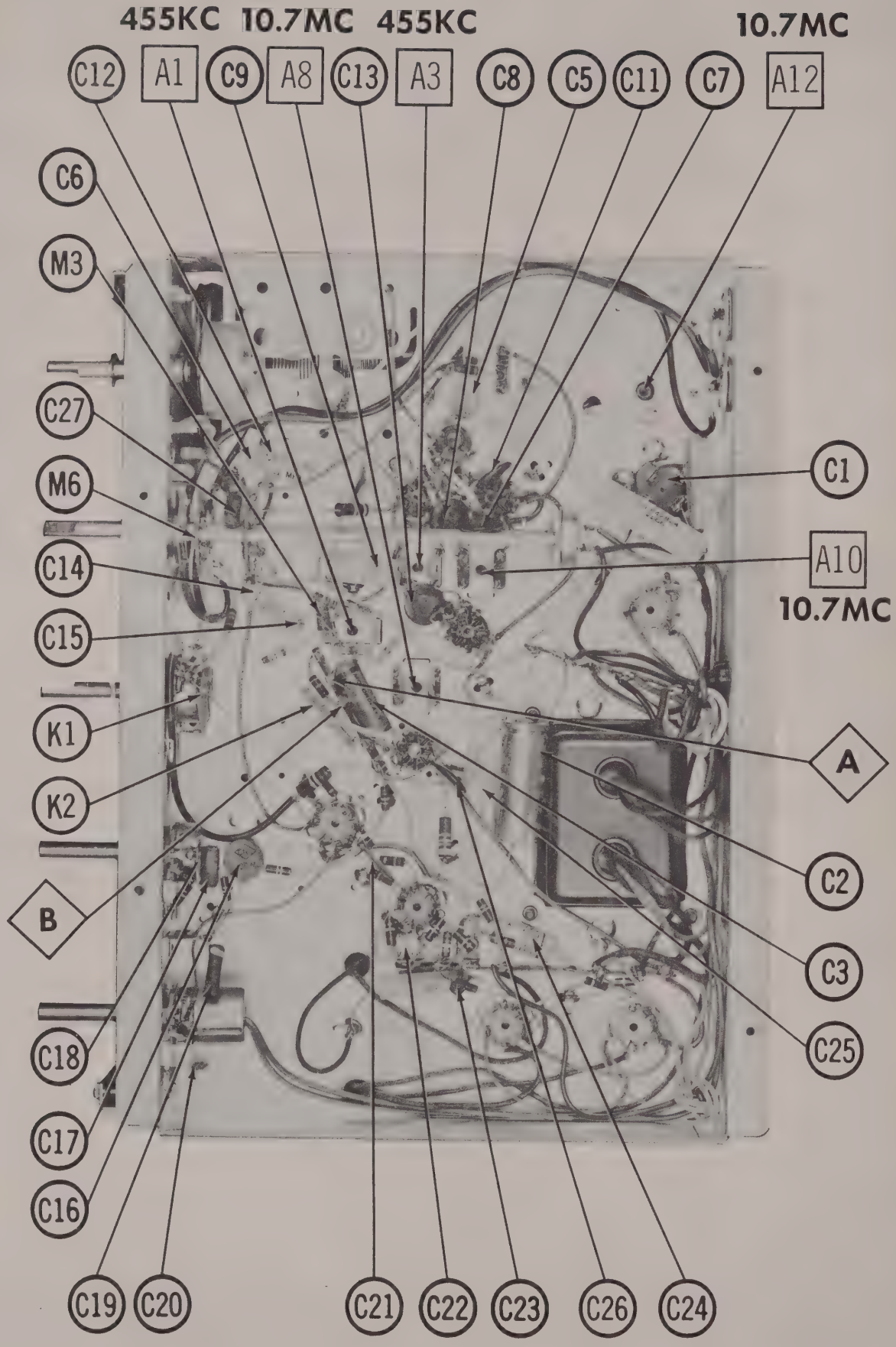
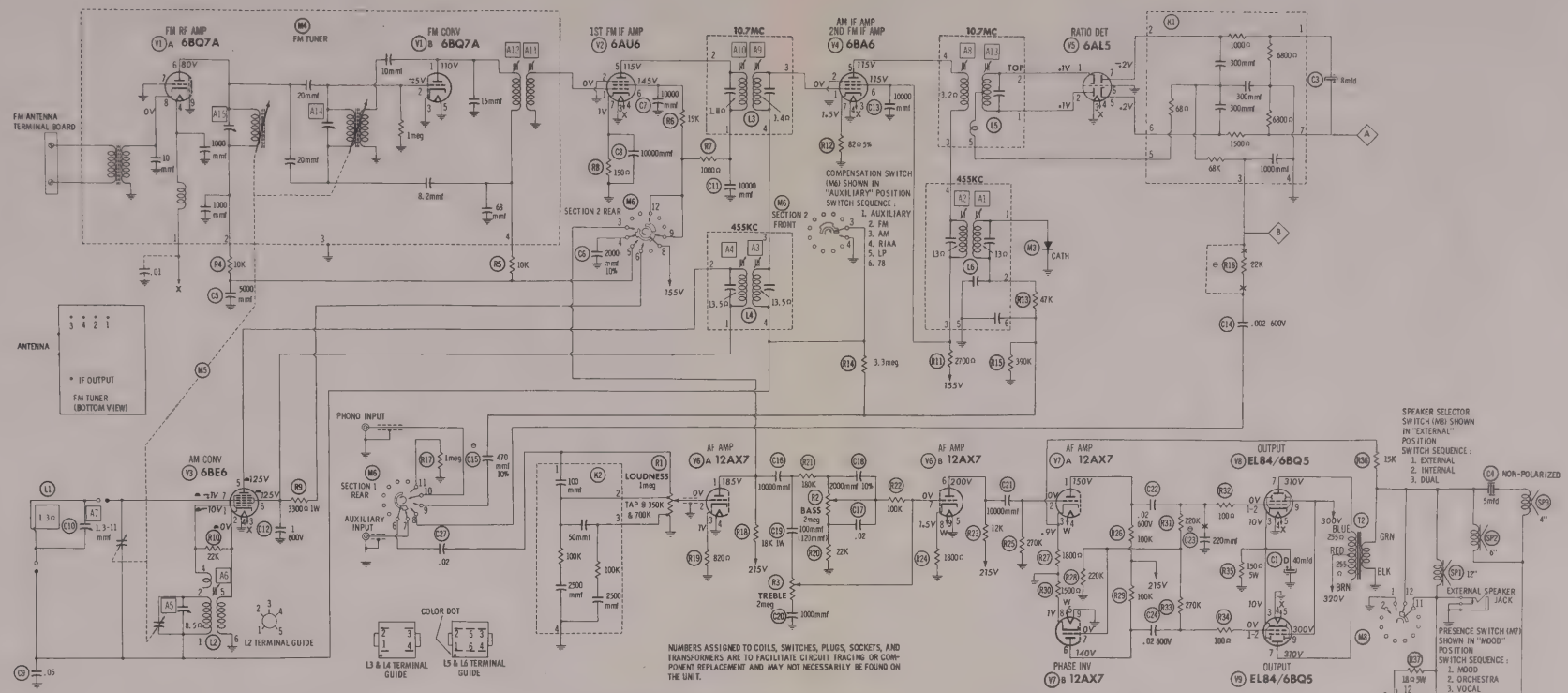
SET 471 FOLDER 10



CHASSIS BOTTOM VIEW — ALIGN., CAPACITOR & MISC. IDENT.



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

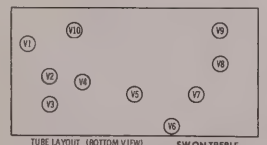
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

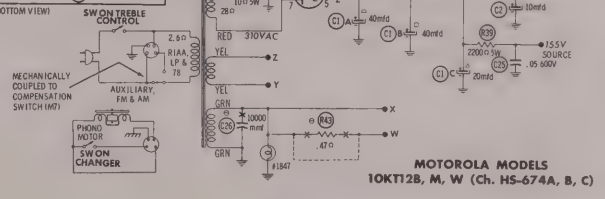
RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	↑15K	1meg	0Ω	.1Ω	0Ω	↑15K	0Ω	0Ω	0Ω
V2	6AU6	1.3Ω	0Ω	0Ω	.1Ω	↑5500Ω	↑20K	150Ω		
V3	6BE6	∞ 22K	∞ .6Ω	0Ω	.1Ω	↑= 7800Ω	↑= 7800Ω	∞ 3.7meg		
V4	6BA6	1Ω 3.7meg ∞	0Ω	.1Ω	0Ω	↑7200Ω	↑7200Ω	82Ω		
V5	6AL5	INF	INF	0Ω	.1Ω	8300Ω	0Ω	7800Ω		
V6	12AX7	↑24K	0Ω	820Ω	0Ω	0Ω	↑18K	120K	1800Ω	1Ω
V7	12AX7	↑105K	270K	1800Ω	.1Ω	.1Ω	↑105K	220K	1500Ω	0Ω
V8	EL84 6BQ5	440K	440K	150Ω	0Ω	.1Ω	NC	↑255Ω	NC	↑330Ω
V9	EL84 6BQ5	490K	490K	150Ω	0Ω	.1Ω	NC	↑255Ω	NC	↑330Ω
V10	EZ81 6CA4	30Ω	NC	¶	INF	INF	NC	28Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT. ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
↑ MEASURED FROM PIN 3 OF V10.
∞ MEASURED IN "AM" POSITION.
NC NO CONNECTION.



TUBE LAYOUT (BOTTOM VIEW)



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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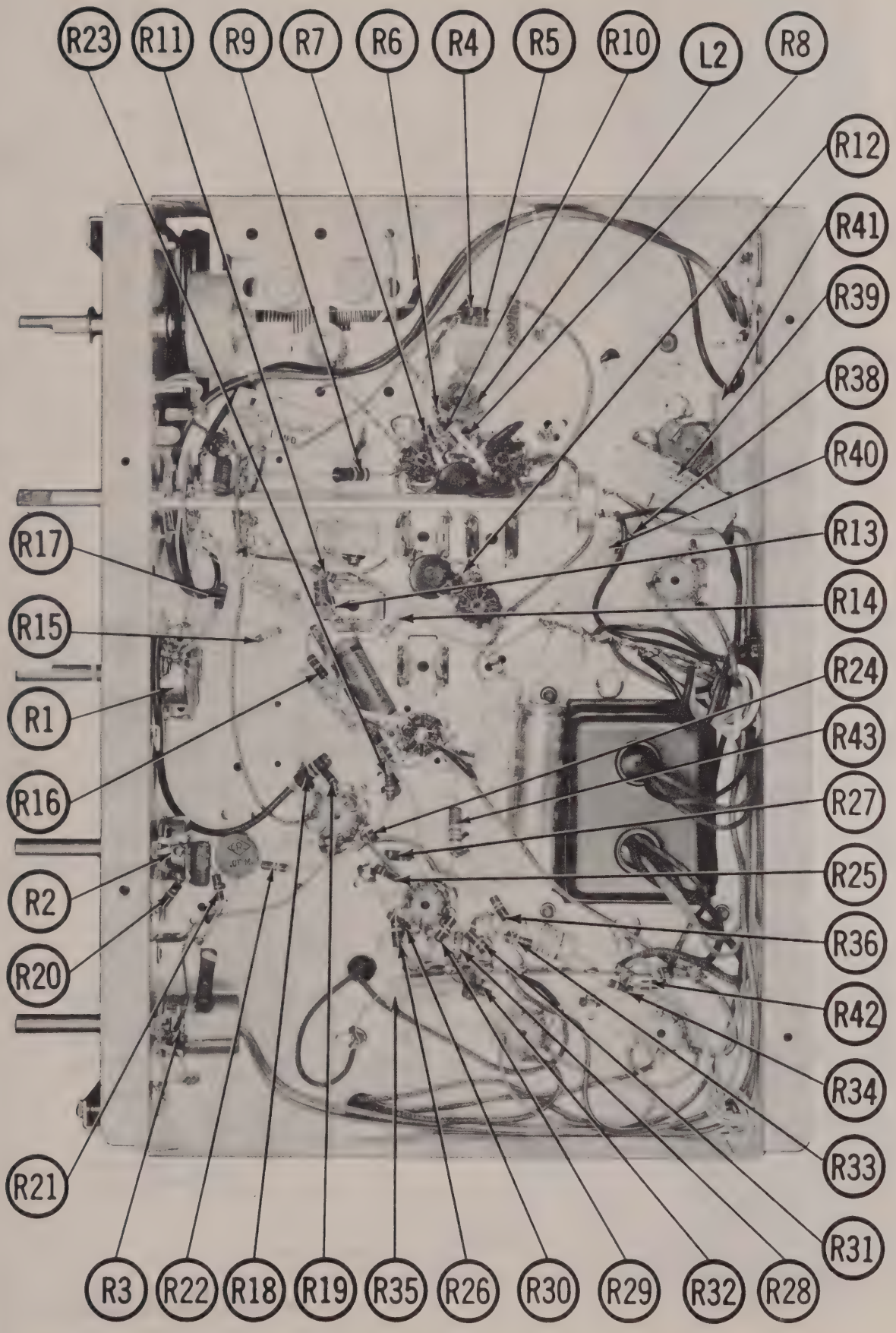
MOTOROLA MODELS
10KT12B, M, W (Ch. HS-674A, B, C)



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A4, A6	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531
A5, A7, A14, A15	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A8, A9, A10, A13	GENERAL CEMENT #5097, 8727 WALSCO #2515
A11, A12	GENERAL CEMENT #9440

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug (front section) of tuning gang. Low side to chassis.	455KC (400~ Mod.)	AM	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1620KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	535KC	"	Tuning gang fully closed.	"	A6	"
4.		"	1400KC	"	Tune to 1400KC Signal	"	A7	With chassis installed in cabinet adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.		Across FM antenna terminals.	10.7MC (Unmod.)	FM	High end stop.	DC probe to point (A). Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
6.		"	"	"	"	DC probe to point (B). Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.		Across FM antenna terminals.	10.7MC (450KC Swp)	FM	High end stop	Vert. amp. thru 10K to point (A). Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry similar to Fig. 1.
6.		"	"	"	"	Vert. amp. thru 10K to point (B). Low side to chassis.	A13	Reconnect C3. Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.		Across FM antenna terminals.	108.1MC (Unmod.)	FM	High end stop	DC probe to point (A). Common to chassis.	A14	Adjust for maximum deflection.
8.		"	98MC	"	Tune to 98MC Signal	"	A15	"

FIG. 1

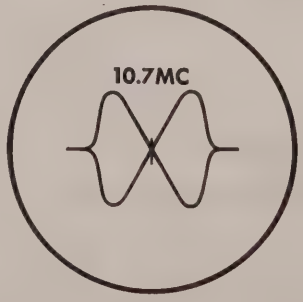


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	6BQ7A
V2	1st FM IF Amp.	6AU6
V3	AM Converter	6BE6
V4	2nd FM-1st AM IF Amp.	6BA6
V5	Ratio Det.	6AL5
V6	AF Amplifier	12AX7
V7	AF Amp. -Phase Inv.	12AX7
V8	Output	EL84/6BQ5
V9	Output	EL84/6BQ5
V10	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	23D641531	AFH4-53	D0460	FP430.6	TMQ-58	TVL-4739	
B	■40	350							
C	▲20	350							
D	40	25							
C2	10	400	23B642409	PRS1720	BR1045	TC72	TD-10-450	TVA-1705	
C3	8	50	23A638536	PRS1405	BBR8-150	TC41	TD-8-150	TVA-1405	
C4	5	10NP	23A632250	NP-PRS7405	BBR10-25 †	TCN105		TVAS-1110 *	

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

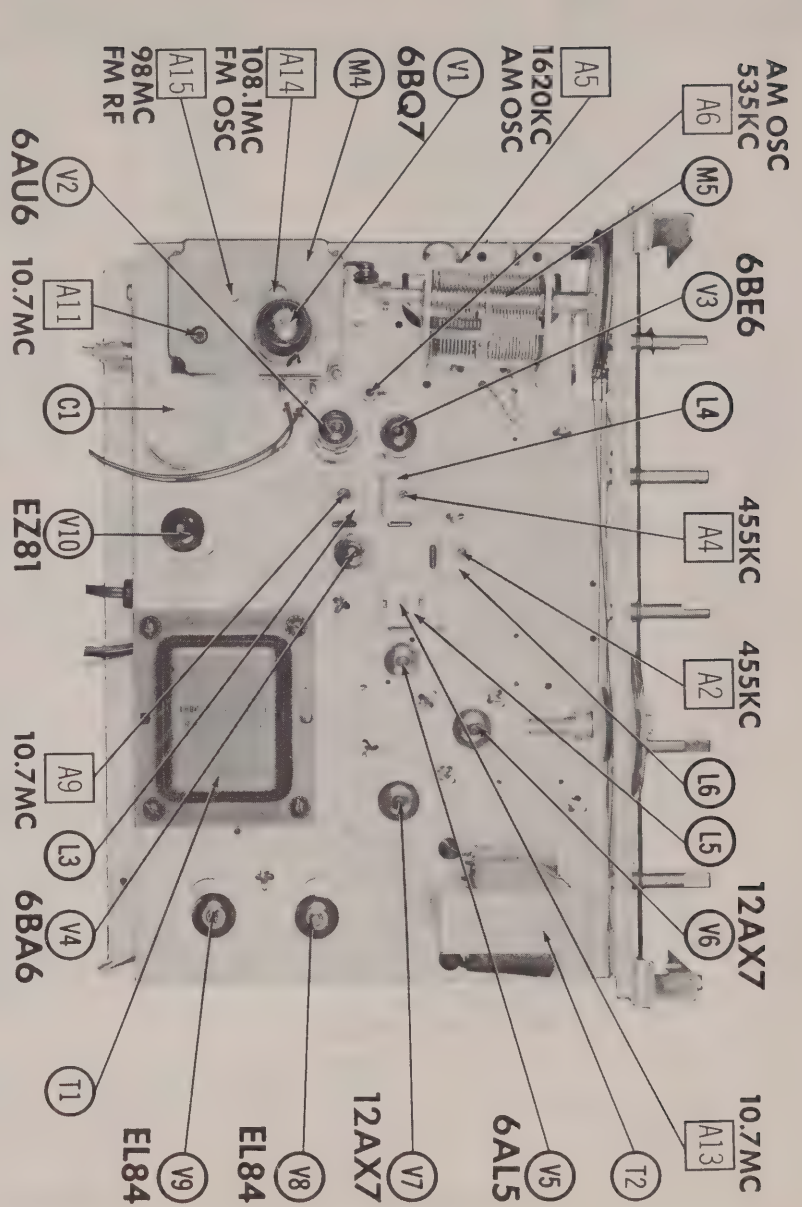
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C6	2000 10%		DI-2000		PM6D2	CCS-202	GP220	10TS-D20
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C10	1.3-11	#20B641777						
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	.002 600V		P688N-002	D6-202	CUB6D2	6DP-1-202	GEM-622	6TM-D2
C15	470 10%	Note 1	DI-470	DD-471	22R5T47	CCD-471	GP347	10TS-T47
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C18	2000 10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C19	100	(120mmf) *	SI 100	D6-101	L10T1	CCD-101	UC-531	5GA-T10
C20	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S2
C23	220	Note 2	DI-220	DD-221	L10T22	CCD-221	B-322	5GA-T22
C24	.02 600V		P688N-02	DD-203	CUB6S2	6DP-2-203	GEM-612	6TM-S2
C25	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2

Note 1. Chassis HS-674A uses 2000mmf in this application.
Note 2 Not used in some versions.
Motorola Part Number.
* Alternate Value.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg	½	18B641721	BT-165		Q18-137XX	UDT-289	Loudness, Tap @ 350K & 700K
R2A	2meg	½	18K641508	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	18B641776	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	10K	
R5	10K	
R6	15K	
R7	1000Ω	
R8	150Ω	
R9	3300Ω 1W	
R10	22K	
R11	2700Ω	
R12	82Ω 5%	
R13	47K	
R14	3.3meg	
R15	390K	
R16	22K	①
R17	1meg	

ITEM No.	RATING	REMARKS
R18	18K 1W	
R19	820Ω	
R20	22K	
R21	180K	
R22	100K	
R23	12K	
R24	1800Ω	
R25	270K	
R26	100K	
R27	1800Ω	
R28	220K	
R29	100K	
R30	1500Ω	
R31	220K	

ITEM No.	RATING	REMARKS
R32	100Ω	
R33	270K	
R34	100Ω	
R35	150Ω 5W	
R36	15K	
R37	18Ω 5W	
R38	3900Ω	
R39	2200Ω 5W	
R40	2200Ω 5W	
R41	330Ω 5W	
R42	10Ω	
R43	.47Ω	#17K488266 ②

① Not used in Ch. HS-674A, B.
② Not used in some versions. Other versions used 1Ω 2W, 1.2Ω, .94Ω choke. Replace with part listed.
Motorola Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Ratio Detector Network	300mmf, 300mmf, 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, 6800Ω, 6800Ω, 68K	51B639144	Aerovox PA-694 Centralab PC-342
K2	Loudness Comp.	50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	51B641643	Aerovox PA-683 Centralab PC-325 Sprague TC-5

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	1V642422						①
L2	AM Osc. Coil	24B638340	14-1073	14-1073	BC-393	69-OSC		
L3	2nd FM IF	24K642112	16-3487	16-3487	FM-254	1463		
L4	1st AM IF	24K641654	16-6758	16-6758	BC-352	12-C1	RF-1	
L5	Ratio Detector	24C638488	17-3498	17-3498	FM-255	1465		
L6	2nd AM IF	24K641655	16-6770	16-6770	BC-355	12-C6		

① Includes Panel & C10.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .77A	560 VCT @.100A	6.3V@ .9A	25C641644						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 4.5A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5500Ω CT	6-8Ω	25C641731	24S55 ①	A-2905	AU-609①	A-3880	24S55①	S-57Z①	① Drill New Mounting Hole

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	50K642356	12AZ7.8	Parallel & Phase
SP2	6"	PM	14-16Ω	50C642357	6AZ14.1	
SP3	4"	PM	10-12Ω	50C636446	4A1TZ10.6	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	MOTOROLA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		† 89TB	Not Req.	*66	Not Req			8TA4-S	N-8TA-S

* Use PT-3 Mount.
† Includes Mount.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MOTOROLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2		*W-101STS † or *W-101STD ♦ or *W-102S †	S69X † or S69XSD † ♦ or S69XDD ♦	† Jewel ♦ Diamond * Includes Cartridge

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3		48K636691	1N60	1N60	1N295	AM Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	FM Tuner	77D638430	Complete
M5	Tuning Cap.	19C641649	2 Gang, Ant. 11—512mmf, Osc. 23—143mmf
M6	Switch	40D642108	Compensation (Includes Off-On switch (Part #40K643293)
M7	Switch	40B641705	Presence
M8	Switch	40B641705	Speaker

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Bezel	13K641516	Dial (Lower)
Bezel	13D641512	Dial (Upper)
Knob	36K641556	Tuning
Knob	36K641577	Bass, Treble, Loudness, Compensator
Knob	36A641706	Presence, Speaker
Dial Pointer	1K641665	

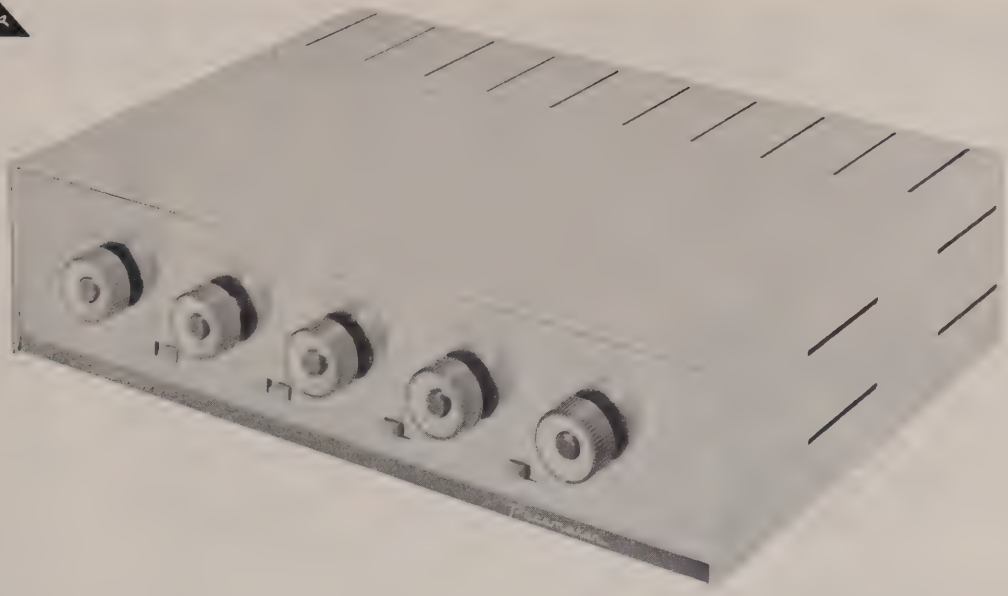
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

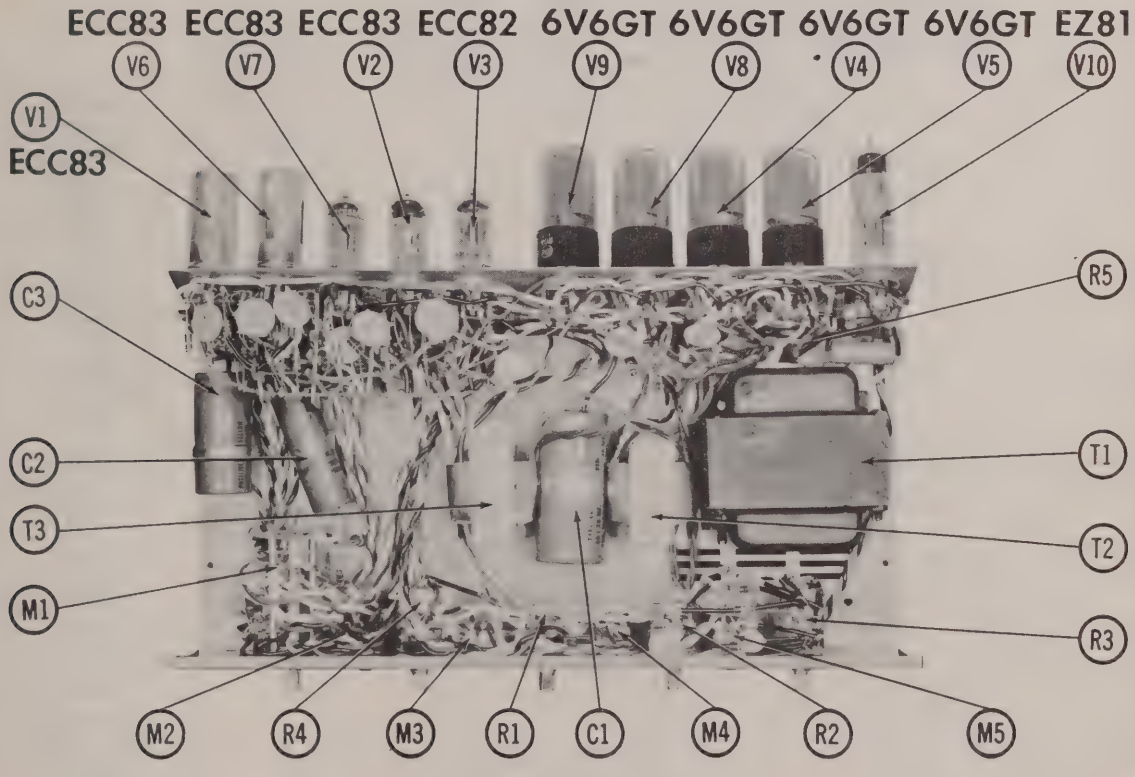
PACEMAKER
MODEL 2221B

PACEMAKER
MODEL 2221B



TRADE NAME	Pacemaker Model 2221B		
MANUFACTURER	Bell Sound Div., Thompson Ramo Wooldridge Inc., 555 Marion Road, Columbus 7, Ohio		
TYPE SET	AC Operated 10 Tube Stereo Amplifier		
POWER SUPPLY	110-120 Volts AC, 50-60 Cycles	RATING	95 Watts, 1 Amp. @ 117 Volts AC

PACEMAKER
MODEL 2221B



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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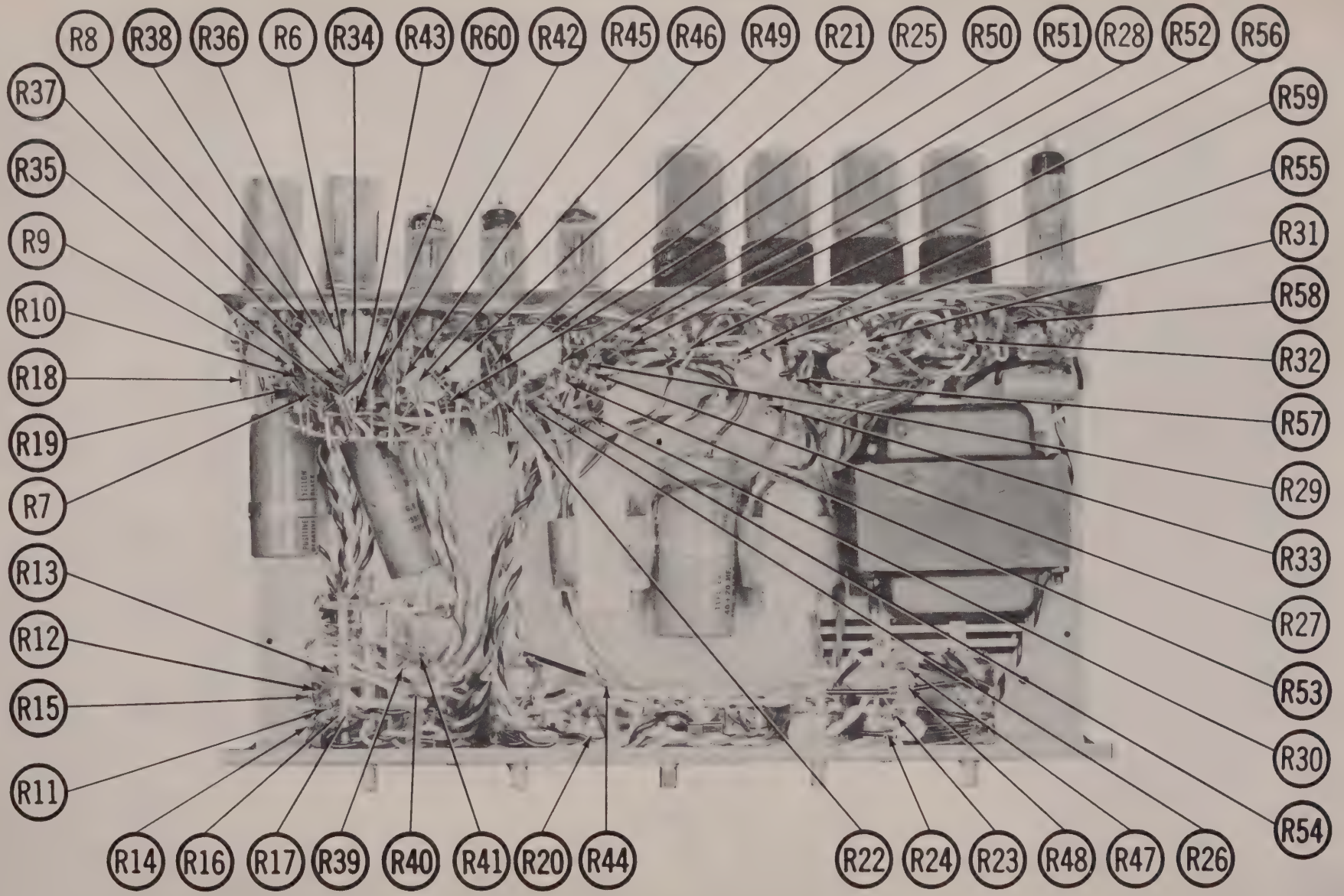
JV522

SET 471 FOLDER 11



CHASSIS TOP VIEW—RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel Phono, Tape Preamplifier	ECC83/12AX7
V2	Left Channel AF Amplifier	ECC83/12AX7
V3	Left Channel Phase Inv. - Right Channel Phase Inv.	ECC82/12AU7
V4	Left Channel Output	6V6GT
V5	Left Channel Output	6V6GT
V6	Right Channel Phono, Tape Preamplifier	ECC83/12AX7
V7	Right Channel AF Amplifier	ECC83/12AX7
V8	Right Channel Output	6V6GT
V9	Right Channel Output	6V6GT
V10	Rectifier	EZ81/6CA4

ELECTROLYTIC CAPACITORS

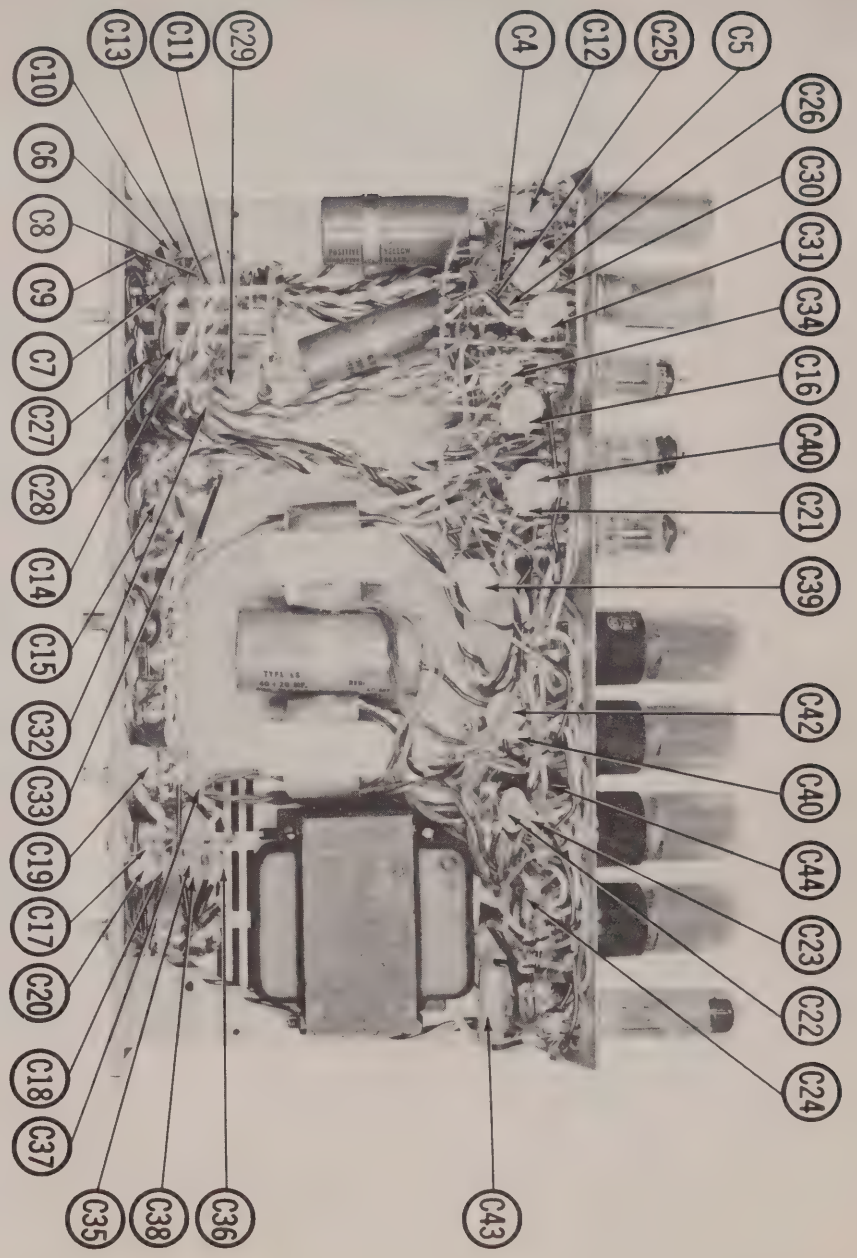
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PACEMAKER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	400	23B27	PRS2420	BBRQ22245C	TCD78	TDLD-31	TVA-2740	
B	20	400							
C2A	10	350	23B14	PRS360	BBRD1145	TCD62	TDLD-26	TVA-2722	
B	10	350							
C3	500	25	23B24	PRS1290	BBR5002	TC2505	TD-500-25	TVA-1209	

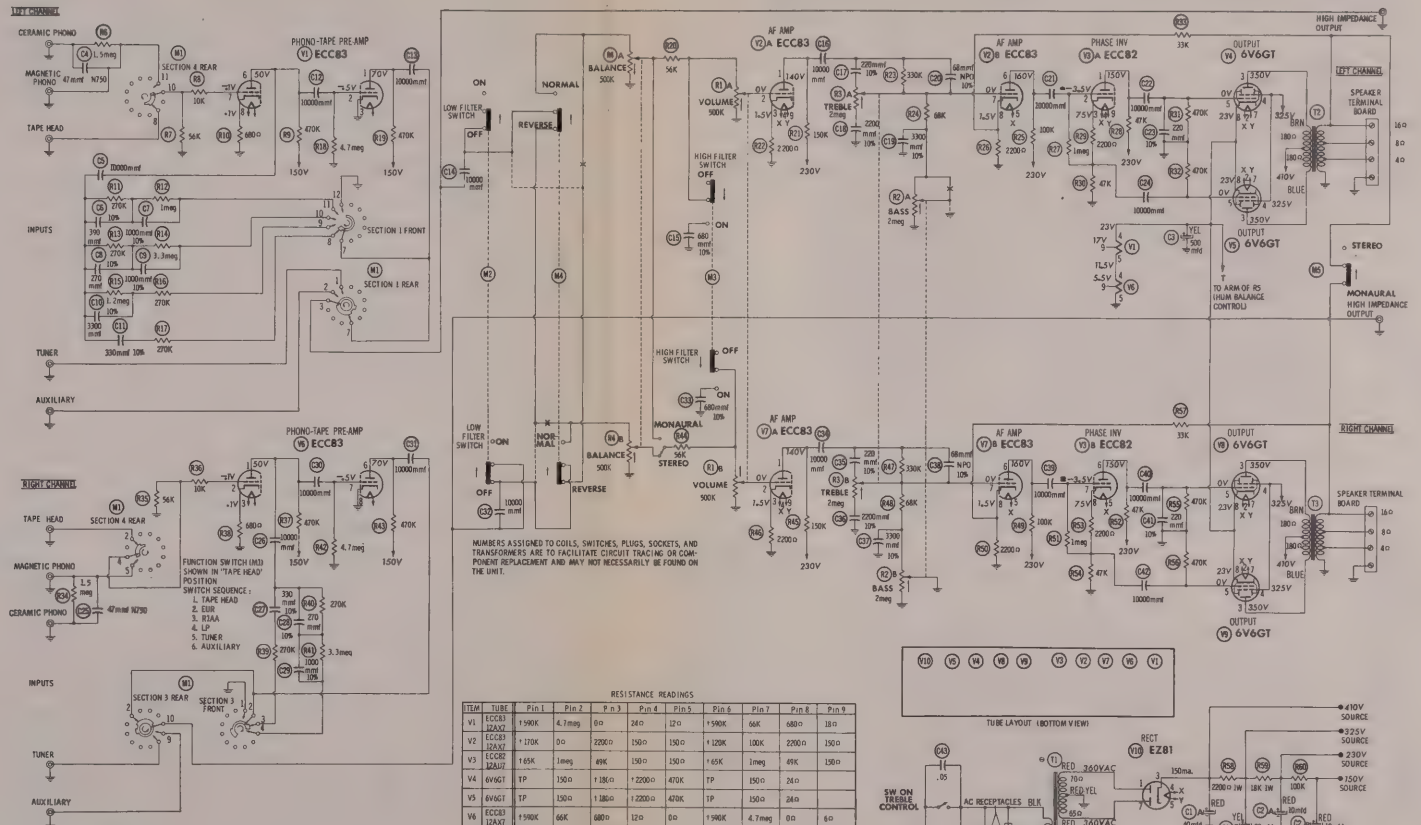
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	390 10%		DI-390	DD-391	L10T39	CCD-391	GP339	10TS-T39
C7	1000 10%		DI-1000	DD-102	PM6D1	CCS-102	JL-210	10TS-D10
C8	270 10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C9	1000 10%		DI-1000	DD-102	PM6D1	CCS-102	JL-210	10TS-D10
C10	3300 10%		DI-3300		PM6D33	CCS-332	JL-233	10TS-D33
C11	330 10%		DI-330	DD-331	L10T33	CCD-331	JL-333	10TS-T33
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		DI-10000	DD-1032	BYB10S1M	CCD-103	GP110	5GA-S10
C15	680 10%		DI-680	DD-681	1R5T68	CCS-681	JL-368	10TS-T68
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	220 10%		DI-220	DD-221	L10T22	CCD-221	JL-220	10TS-T22
C18	2200 10%		DI-2200		PM6D22	CCD-222	JL-222	10TS-D22
C19	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C20	68 NPO 10%		NPO-DI 68	DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	220 10%		DI-220	DD-221	L10T22	CCD-221	JL-322	10TS-T22
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	330 10%		DI-330	DD-331	L10T33	CCD-331	JL-333	10TS-T33
C28	270 10%		DI-270	DD-271	L10T27	CCD-271	GP327	10TS-T27
C29	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	JL-210	10TS-D10
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C32	10000		DI-10000	DD-1032	BYA10S1M	CCD-103	GP110	5GA-S10
C33	680 10%		DI-680	DD-681	1R5T68	CCS-681	JL-368	10TS-T68
C34	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	220 10%		DI-220	DD-221	L10T22	CCD-221	JL-322	10TS-T22
C36	2200 10%		DI-2200		PM6D22	CCS-222	JL-222	10TS-D22
C37	3300 10%		DI-3300		PM6D33	CCS-332	JL-233	10TS-D33
C38	68 NPO 10%		NPO-DI 68	DTZ-68	C10Q68C	CCTO-681	CNO-468	10TCC-Q68
C39	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	220 10%		DI-220	DD-221	L10T22	CCD-221	JL-322	10TS-T22
C42	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C44	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CHASSIS—TOP VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	†590K	4.7meg	0Ω	24Ω	12Ω	†590K	66K	680Ω	18Ω
V2	ECC83 12AX7	†170K	0Ω	2200Ω	150Ω	150Ω	†129K	100K	2200Ω	150Ω
V3	ECC82 12AU7	†65K	1meg	49K	150Ω	150Ω	†65K	1meg	49K	150Ω
V4	6V6GT	TP	150Ω	†18Ω	†2200Ω	470K	TP	150Ω	24Ω	
V5	6V6GT	TP	150Ω	†18Ω	†2200Ω	470K	TP	150Ω	24Ω	
V6	ECC83 12AX7	†590K	66K	680Ω	12Ω	0Ω	†590K	4.7meg	0Ω	6Ω
V7	ECC83 12AX7	†170K	0Ω	2200Ω	150Ω	150Ω	†120Ω	100K	2200Ω	150Ω
V8	6V6GT	TP	150Ω	†18Ω	†2200Ω	470K	TP	150Ω	24Ω	
V9	6V6GT	TP	150Ω	†18Ω	†2200Ω	470K	TP	150Ω	24Ω	
V10	EZ81 6CA4	70Ω	NC	¶	150Ω	150Ω	NC	65Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V10.
* MEASURED FROM PIN 8 OF V3.
• MEASURED FROM PIN 3 OF V3.
NC NO CONNECTION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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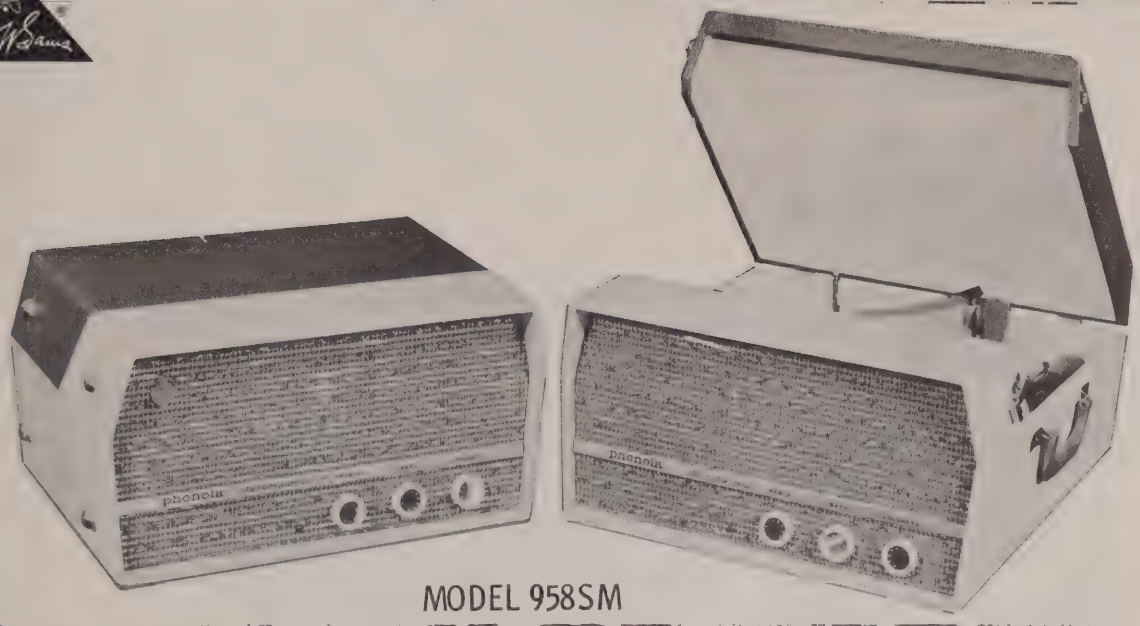
PACEMAKER MODEL 2221B

PHOTOFACT® Folder

PHONOLA
MODELS 958SM, 958SR

PHONOLA
MODELS 958SM, 958SR

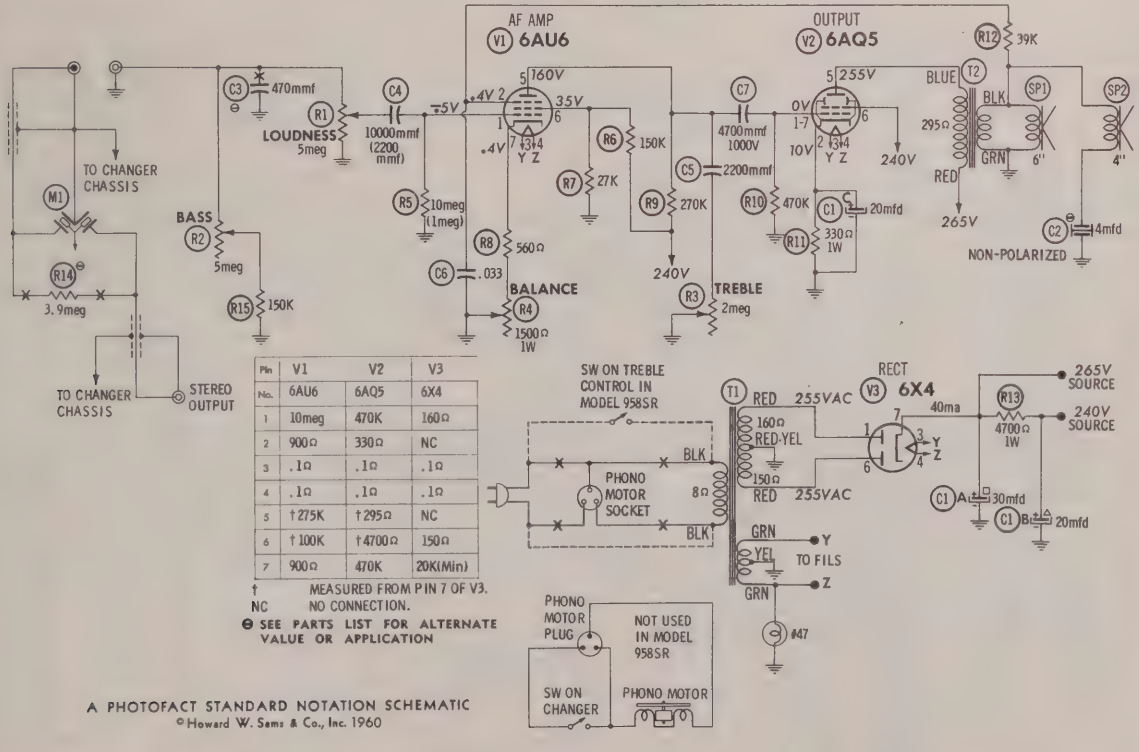


MODEL 958SM

TRADE NAME	Phonola Models 958SM, 958SR
MANUFACTURER	Waters Conley Co., Rochester, Minnesota
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	105-125 Volts AC, 60 Cycles RATING 28 Watts, .32 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #13374 — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

PHONOLA
MODELS 958SM, 958SR



Pin No.	V1	V2	V3
1	10meg	470K	160Ω
2	900Ω	330Ω	NC
3	.1Ω	.1Ω	.1Ω
4	.1Ω	.1Ω	.1Ω
5	†275K	†295Ω	NC
6	†100K	†4700Ω	150Ω
7	900Ω	470K	20K(Min)

† MEASURED FROM PIN 7 OF V3.
NC NO CONNECTION.
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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JT476

SET 471 FOLDER 12

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	6AU6	V3	Rectifier	6X4
V2	Output	6AQ5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PHONOLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■30	350	13234	AFH3-109	C0830	FP330	TMT-94	TVL-3636	
B	▲20	350							
C	20	25							
C2	4	25VNP		PRS7405	BBR8-150 †	TCN504		TVAS-1150 *	①

† Use 2 units. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.
① Some versions may use 4mfd@10VAC in this application (Part #12961).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	470	①	BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C6	.033 200V		P288N-033		CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C7	4700 1000V		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47

① Not Used In Model 958SR.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHONOLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg	½	13226	B-88	A47-5meg-Z	Q13-141	U65	Loudness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	5meg	½	13226	B-88	A47-5meg-Z	Q13-141	U65	Bass
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	2meg	½	13224	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4	1500Ω	1(WW)	13239		39-1500	112-1500	FL-1.5K	Balance

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	10meg	(1meg) *
R6	150K	
R7	27K	
R8	560Ω	

Note 1. Not used in some versions.

ITEM No.	RATING	REMARKS
R9	270K	
R10	470K	
R11	330Ω 1W	
R12	39K	

* Alternate Value.

ITEM No.	RATING	REMARKS
R13	4700Ω 1W	Note 1
R14	3.9meg	
R15	150K	

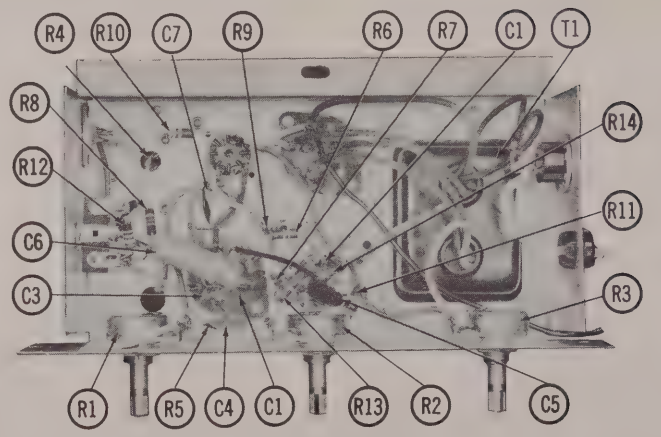
TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @.32A	510 VCT @.040A	6.3 VCT @1.5A	13227	24R09	P-3048		PM8403	24R09	R-8B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PHONOLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4600Ω	3-4Ω	13222	24S51	A-2930	AU-601	A-3877	24S51	S-3X	

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PHONOLA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	3-4Ω	12963	6A21	
SP2	4"	PM	3-4Ω	11792	4A07	

PHONO CARTRIDGE

ITEM No.	PHONOLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	WC-13376	13TB *	Not Req.	66 ‡	Not Req.			8TA4-S * or 8TA4-D *	N-8TA-S

* Includes Mounting.
‡ Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA PHONOLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M2	WC-13377	W-103STSS † or W-103STDS †♦	CS-1X † or CS-1XD ♦	† Jewel ♦ Diamond

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	13132-8E	
Case	13387	Model 958SM
Case	13388	Model 958SR
Handle	12956-3B	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ROLAND
MODEL TR8 (71-484)

ROLAND
MODEL TR8 (71-484)

ROLAND
MODEL TR8 (71-484)

TRADE NAME	Roland Model TR8 (71-484)
MANUFACTURER	Roland Radio Corp., 716 S. Columbus Ave., Mount Vernon, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	540 - 1620KC
RATING	10.6MA @ 9 Volts DC (No Signal, Min. Volume) 15MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A4, A5 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to base of Converter. Low side to chassis.	455KC (400% Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"
4.		"	600KC	600KC	"	A6	Adjust for maximum output while rocking tuning gang.

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JF 575

SET 471 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N411	Converter		2N411	2N486	2N411	PNP
X2	2N409	1st IF Amplifier		2N409	2N483	2N409	PNP
X3	2N409	2nd IF Amplifier		2N409	2N483	2N409	PNP
X4	2N406	Detector		2N406	2N633	2N406	PNP
X5	2N405	Driver		2N405	CK-872	2N382	PNP
X6	2N306	Output	2N306			2N306	NPN } Matched
X7	2N306	Output	2N306			2N306	NPN } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	10	581014	PWE10100	NLW100-10	TT15X100	ML100-15	TE-1119.3	
C2	6	7		XPP-10006	NLW6-15	TT12X5	ML6-15	TE-1127.1	Note 1
C3	10	10	581013	XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C4	6	7		XPP-10006	NLW6-15	TT12X5	ML6-15	TE-1127.1	Note 1

Note 1. Some versions may use 5mfd @ 7V in this application (Part #581032).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	4.7 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C16	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	½	368027					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	6800Ω	
R4	10Ω	Note 1
R5	3300Ω	
R6	2200Ω	
R7	330Ω	
R8	4700Ω	
R9	47K	

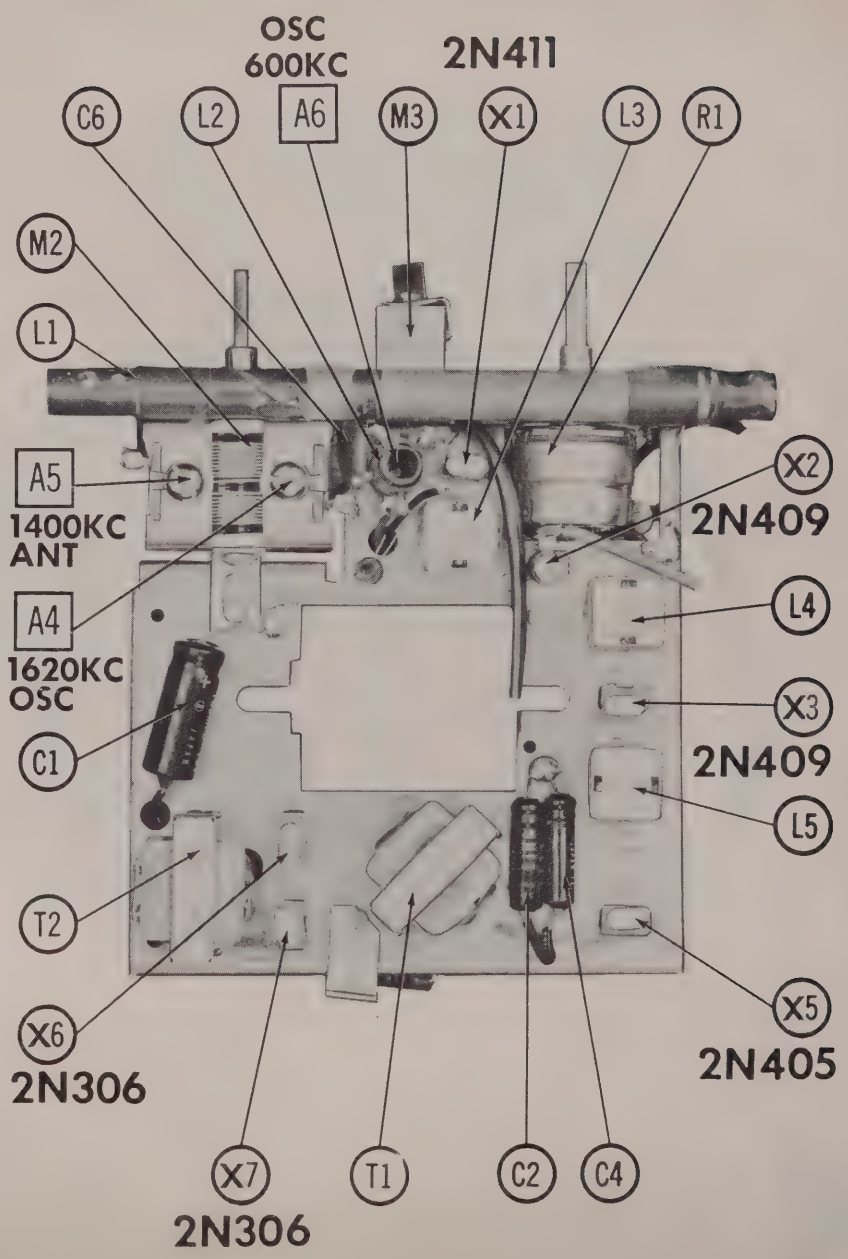
* Alternate Value.

ITEM No.	RATING	REMARKS
R10	22K	
R11	2200Ω	
R12	2200Ω	
R13	68K	
R14	15K	
R15	4700Ω	
R16	3900Ω	Note 1
R17	10Ω	Note 1

Note 1. Not used in some versions.

ITEM No.	RATING	REMARKS
R18	39K	
R19	180K	
R20	1000Ω	
R21	220K	
R22	10Ω	(12Ω) *
R23	100Ω	
R24	3900Ω	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ROLAND PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	464031						
L2	Osc. Coil	455073						
L3	1st IF Trans.	450018	16-9003	16-9003	BC-324	2041		
L4	2nd IF Trans.	450018	16-9003	16-9003	BC-325	2041		
L5	3rd IF Trans.	450019	16-9014	16-9014	BC-326	2042		

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	430270	TR-9			TR-9		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	740Ω CT	3-4Ω	430280	TR-29				TR-29		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	404016	4A1	

BATTERIES

ITEM No.	VOLTAGE	ROLAND PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			930		1015		M-15R	Six required

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M2	Tuning Cap.	590049	2 Gang (Ant. 4-137mmf, Osc. 9-88mmf)
M3	Switch	370029	Local-Distant (SPDT, Slide Type)

CABINETS & CABINET PARTS

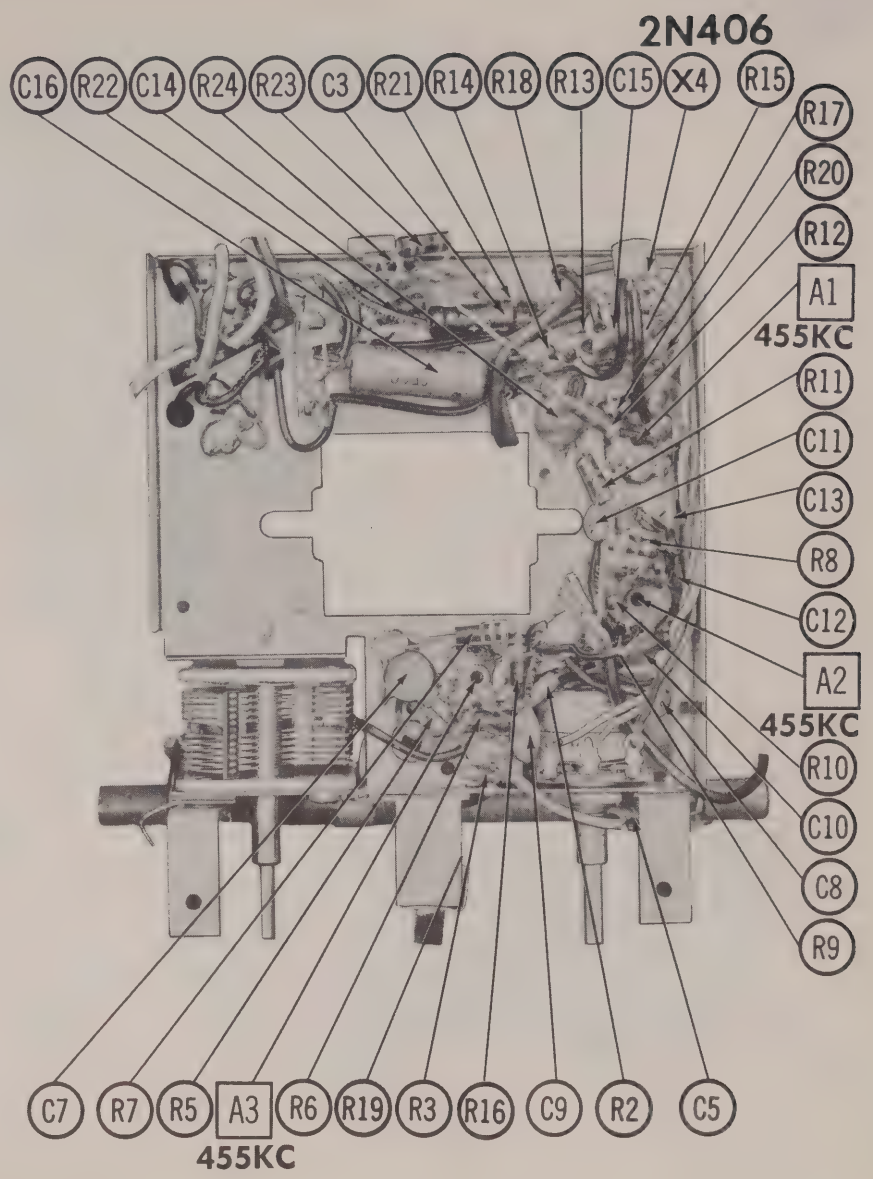
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

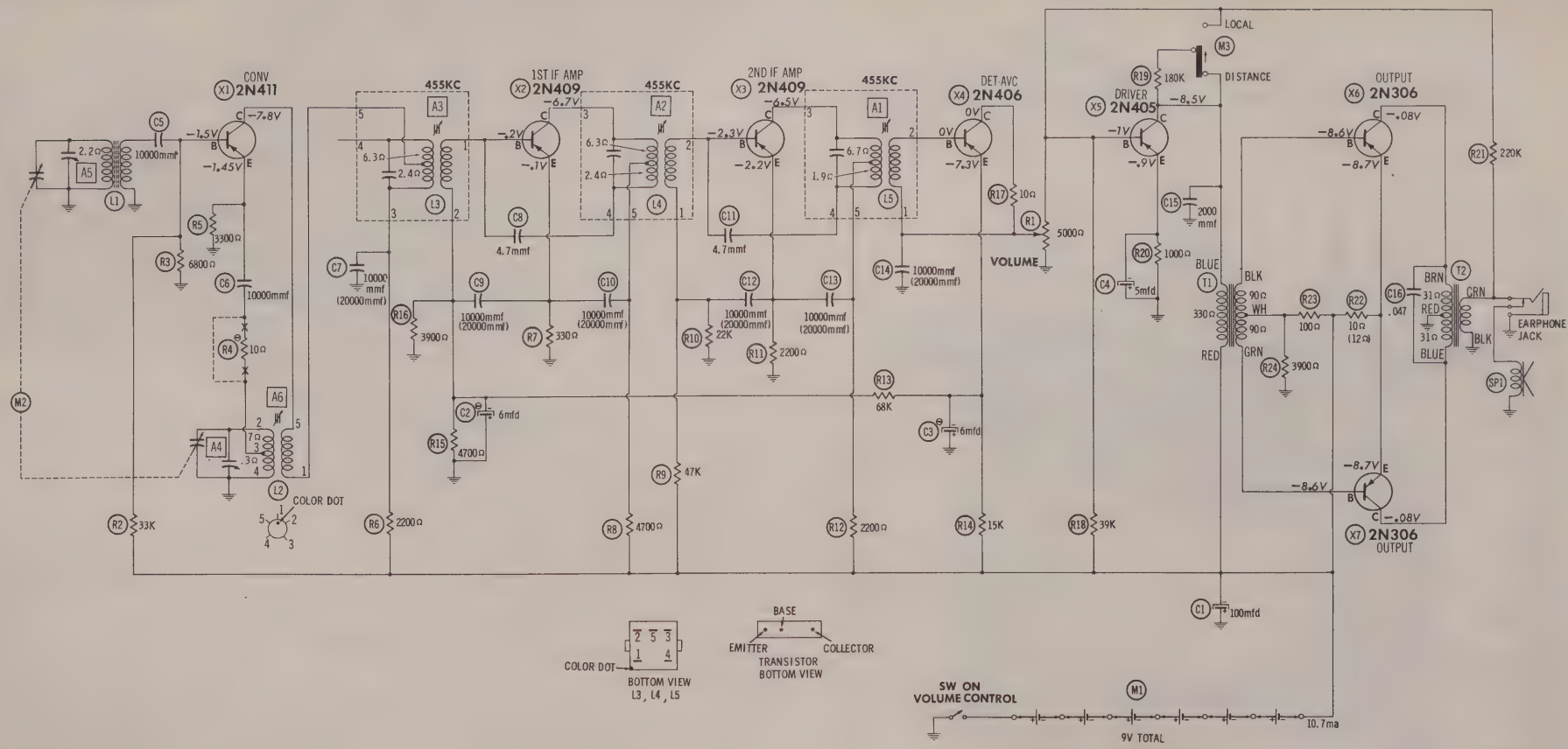
NAME	PART NO.	DESCRIPTION
Knob	272104	Tuning
Knob	272273	Volume
Knob	272247	Switch Indicator
Knob	272248	Calibrated
Case	200061	Black Leather
Case	200062	Tan Leather
Case	200063	Black Tolax
Case	200064	Tan Tolax

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N411	5500Ω	3000Ω	†2200Ω
X2	2N409	2500Ω	330Ω	†4700Ω
X3	2N409	18K	2200Ω	†2200Ω
X5	2N405	5000Ω	1000Ω	†300Ω
X6	2N306	†180Ω	†12Ω	30Ω
X7	2N306	†180Ω	†12Ω	22Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
RESISTANCE MEASUREMENTS OF X4 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
† MEASURED FROM JUNCTION OF R18, R22, AND R23.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ROLAND
MODEL TR8 (71-484)

PHOTOFACT® Folder

SABA MODELS
300-9C, 300-9T

SABA MODELS
300-9C, 300-9T

MODEL 300-9C

SABA MODELS
300-9C, 300-9T

TRADE NAME	Saba Models 300-9C, 300-9T			
IMPORTER	A. E. Dufenhorst Co., 121 N. Third Street, Rockford, Illinois			
TYPE SET	AC Operated 9 Tube FM-BC-SW-LW Receiver With 4 Speed Automatic Record Changer (The receiver may be manually or automatically tuned)			
POWER SUPPLY	110/125/150/220 Volts AC, 60 Cycles		RATING	61 Watts, .60 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST FREQ. MOD.	510 - 1640KC 88 - 108MC	LONG WAVE SHORT WAVE	140 - 360KC 5.9 - 18.9MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR DUAL 1004 - PHOTOFACT SET 453 FOLDER 6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JM389

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amplifier	EC92	V6	Tuning Indicator	EM84
V2	FM Converter	EC92	V7	Output	EL84
V3	1st FM IF Amplifier-AM Mixer - AM Osc.	ECH81	V8	Trigger IF Amplifier - Trigger	ECL80
V4	2nd FM - 1st AM IF Amp.	EF85	V9	Trigger Discriminator - Trigger Relay Control	EABC80
V5	AM Det. - AVC Det. - AVC Clamper - AF Amp.	EABC80			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SABA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	350	3257036000	PRS2420	BBRD4445	TCD78	TDLD-32		
B	50	350							
C2	32	350	3252018000	PRS1660	BR3035	TC77	TD-30-350	TVA-1610	
C3	50	12	3251117000 ①	SRE12V50	BBR50-25	TT150X50	TD-50-25	TE-1133	
C4	2	350	3252113000	SRE1705	BR245	TT350X2	TD-2-450	TVA-1701	
C5	5	70	3251193000	SRE150V5	NLW5-100	TT150X5	TD-8-150	TE-1404	
C6	2	350	3252113000	SRE1705	BR245	TT350X2	TD-2-450	TVA-1701	
C7	100	12	3251117000	SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1135	

① Part #3251116000 may be used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	.0047 500V 10%		V84C6D47-10%		PM6D47	6DP-1-472	JL-247	6TM-D47
C9	47 N750		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C10	14 P100 ±.5mmf	#3201201000						
C11	.000027 125V 2.5%			TCZ-27		DM-15-270G	MCE220	10TCC-Q27
C12	.00001 125V 10%			D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C13	4-21	#3234011000						
C14	4-21	#3234011000						
C15	.000007 125V ±1mmf			TCZ-6R8	C10V7C	CCTO-6R8	CNO-568	
C16	.000033 125V 2.5%			TCZ-33		DM-15-330G		
C17	.047 125V 10%		V84C2S47-10%		PM2S47	4DP-3-473		2TM-S47
C18	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C19	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C20								
C21	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C22	1.3	#3231001000		820-D		VC-1		
C23	12 NPO		NPO-SI 12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C24								
C25	8 P100	#3201047000						
C26	125 N750			TCN-130	C10T13U	CCTN-151	CNO-312	10TCU-T12
C27	12 P100	#3201050000						
C28	22 N150	#3206048000				*		10TCP-Q22
C29	10 P100	#3201049000						
C30	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C31	.00001 125V 10%			D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C32	.00022 125V 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C33	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C34	.0047 125V 2.5%	#3155153000				DM-20-472G		
C35	.000047 125V			D6-470	L10Q47	CCD-470	UC-5447	5GA-Q47
C36	4-21	#3234011000						
C37	.00047 125V			D6-471	BYA10T47	CCD-471	UC-5347	5GA-T47
C38	4-21	#3234011000						
C39	.00042 125V 2.5%	#3151232000				DM-15-431G		
C40	.000051 125V 2.5%			TCZ-51		DM-15-510G		
C41	.00027 125V 2.5%	#3151139000				DM-15-271G		
C42	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C43	.000027 125V 2.5%			TCZ-27		DM-15-270G		
C44	.000047 125V 2.5%			TCZ-47		DM-15-470G		

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C45	.00022 125V 2.5%	#3155137000				DM-15-221G		
C46	.00022 125V 2.5%	#3155137000				DM-15-221G		
C47	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C48	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C49	.015 125V		P288N-015	DD-153	PM4S15	4DP-1-153	GEM-4115	4TM-S15
C50	.3					*		10TCP-Q10
C51	10 N150	#3206024000						
C52	.000022 125V 10%			D6-220	L10Q22	CCD-220	GP422	10TS-Q22
C53	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C54	.000005 125V			D6-500	L10Q5	CCD-500	UC-545	5GA-Q50
C55	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C56	.000027 125V 5%			TCZ-27	C10Q27C	DM-15-270J	CNO-427	10TCC-Q27
C57	12 P500	#3201070000						
C58	.0001 125V 2.5%			TCZ-100		DM-15-101G		
C59	.00022 125V 2.5%	#3155137000				DM-15-221G		
C60	.00022 125V 2.5%	#3155137000				DM-13-221G		
C61	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C62	.0001 125V		P288N-0001	D6-101	L10T1	CCD-101	UC-531	5GA-T10
C63	.00082 125V 5%				1R5T82	DM-15-821J		MS-382
C64	.00047 125V 10%			D6-471	1R5T47	CCS-471	GP347	10TS-T47
C65	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C66	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C67	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	.01 125V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-211	2TM-S1
C69	.000068 10%			D6-680	L10Q68	CCD-680	GP468	10TS-Q68
C70	.022 100V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C71	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-615	6TM-S1
C72	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C73	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C74	.022 125V	#3111012000						
C75	.022 125V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C76	.00022 125V 10%			D6-221	L10T22	CCD-221	GP322	10TS-T22
C77	.0047 125V		P288N-0047	D6-472	CUB2D47	CCD-472	UC-5247	5HK-D47
C78	.0047 125V		P288N-0047	D6-472	CUB2D47	CCD-472	UC-5247	5HK-D47
C79	.022 500V		P688N-022		CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C80	.1 500V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C81	.0001 125V 10%			D6-101	PM6T1	CCD-101	GP310	10TS-T10
C82	.0001 500V 10%			D6-101	PM6T1	CCD-102	GP310	6TM-T1
C83	5 P100	#3201062000						
C84	.00047 125V 10%			D6-471	1R5T47	CCS-471	GP347	10TS-T47
C85	.00047 125V			D6-471	BYA10T47	CCD-471	UC-5347	5GA-T47
C86	2.2mfd 125V 10%	#3251249000						
C87	.6							
C88	.00001 125V 10%			D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C89	.0001 125V 10%			D6-101	L10T1	CCD-101	GP310	10TS-T10
C90	.001 125V 5%				1R5D1	DM-15-102J	MCJ454	5BF-D10
C91	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-D1
C92	.00047 125V 2.5%	#3151142000				DM-15-471G		
C93	.00047 125V 2.5%	#3151142000				DM-15-471G		
C94	.000056 125V 2.5%			TCZ-56		DM-15-560G		
C95	2500		SI 2500	D6-252	BYA10D25	CCD-252	UC-5225	5HK-D25
C96	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C97	.00027 125V			D6-271	L10T27	CCD-271	GP327	5GA-T27
C98	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C99	.3 320V		P488N-33		PM4P33		GEM-4033	5BF-P33
C100	.25 500V		P688N-25		CUB6P25	6DP-5-254	GEM-6025	6TM-P25
C101	.047 500V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C102	.022 125V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C103	.1 125V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2WF-P10
C104	.0047 500V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C105	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C106	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C107	.022 500V		P688N-022		CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C108	.0047 250V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6147	6TM-D47
C109	.0047 250V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6147	6TM-D47
C110	.01 250V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C111	15 ±2mmf	(Shielded cable)		TCZ-15	C10Q15C	DM-15-150J	CNO-415	10TCC-Q15

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
# Saba Part Number.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SABA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1.3meg	1/2	5804 000 554					Volume, Taps ② 75K, 250K
R2	6meg	1/2	5802 000 533					Bass
R3	500K		5802 000 543					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100Ω	Note 1
R5	470K	
R6	10K	
R7	1meg	
R8	12K	
R9	470K	
R10	180K	
R11	220K	
R12	33K 1W	
R13	33K 1W	
R14	47K	
R15	120Ω	
R16	47K	
R17	33Ω	
R18	3000Ω	
R19	120K	
R20	2.2meg	
R21	3300Ω	
R22	68K	
R23	220K	
R24	10K	
R25	12K	
R26	8200Ω	
R27	1000Ω	
R28	270Ω	
R29	100K	
R30	220K	
R31	100K	
R32	2.7meg	

ITEM No.	RATING	REMARKS
R33	10meg	
R34	1meg	
R35	1meg	
R36	1meg	
R37	470K	
R38	47K	
R39	100K	
R40	2.2meg	
R41	56Ω	
R42	33Ω	
R43	1meg	
R44	27K	
R45	220K	
R46	15K	
R47	4.7meg	
R48	100K	
R49	4.7meg	
R50	220K	
R51	220K	
R52	47K	
R53	3900Ω	
R54	1800Ω	
R55	470Ω	
R56	470Ω	
R57	100K	
R58	2.2meg	
R59	1meg	
R60	1000Ω	
R61	3.3meg	

ITEM No.	RATING	REMARKS
R62	1meg	
R63	170Ω	
R64	4.7meg	
R65	1meg	
R66	470Ω	
R67	100K	
R68	220K	
R69	220K	
R70	100K	
R71	100K	
R72	1meg	
R73	100K	
R74	100K	
R75	1meg	
R76	1meg	
R77	8200Ω	
R78	68K	
R79	270K	
R80	47K	
R81	1000Ω	
R82	47K	
R83	1000Ω	
R84	33K 1W	
R85	390Ω 4W	
R86	1200Ω 2W	
R87	220Ω	
R88	30K	

Note 1. Two turns of insulated wire are wound around this resistor.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SABA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke							
L2	LW Antenna Coil	5806066004						
L3	Loopstick	5804019003						
L4	SW Antenna Coil	5803066004						
L5	LW Antenna Trans.	5804552000						
L6	AM Antenna Trans.	5804551000						
L7	SW Antenna Trans.	5804550000						
L8	LW Osc. Coil	(Part of L5)						
L9	AM Osc. Coil	(Part of L6)						
L10	SW Osc. Coil	(Part of L7)						
L11	1st FM IF	5803910003						
L12A	2nd FM IF	5804410002						
B	1st AM IF							
C	Bandwidth Coil							
L13A	Ratio Detector	5804420002						
B	2nd AM IF							
L14A	FM Trigger IF	5804430002						
B	AM Trigger IF							
C	Trigger Discriminator							
L15	Fil. Choke		19-1000	19-1000	BC-561	4602		luh
L16	Fil. Choke		19-1000	19-1000	BC-561	4602		luh

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap ② 150V, 125V, 117V ② .75A	250V ② .085A	125VCT ② .001A	3819 101 111 ①						
		SEC. 3	SEC. 4							
		20VCT ② .001A	6.3V ② 4.2A							

① Alternate Part #5804300003.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.1	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7500Ω	150Ω SEC.2 3-4Ω	5890 315 004 ①							

① Alternate Part #5804026004.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SABA PART No.	QUAM PART No.	
SP1	8"	PM	4-5Ω	5898410002		
SP2	8"	PM	4-5Ω	5898410002		
SP3	4"	PM	4-5Ω	5898010003		
SP4	4"	PM	4-5Ω	5898010003		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SABA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.087A	B250C125 ①					① Selenium
M2	.001	E125C5 ①					
M3		E625C5 ①					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SABA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4		7/10A 110V						

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	SABA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M5	KS2								

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS	
	SABA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.		
M6	1004-DS † ♦			† Jewel	♦ Diamond

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SABA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M7		RL232 ①	1N60	1N60	1N295	Ratio Det. (Pigtail)
M8		RL232 ①	1N60	1N60	1N295	Ratio Det. (Pigtail)

① Part of IF Transformer

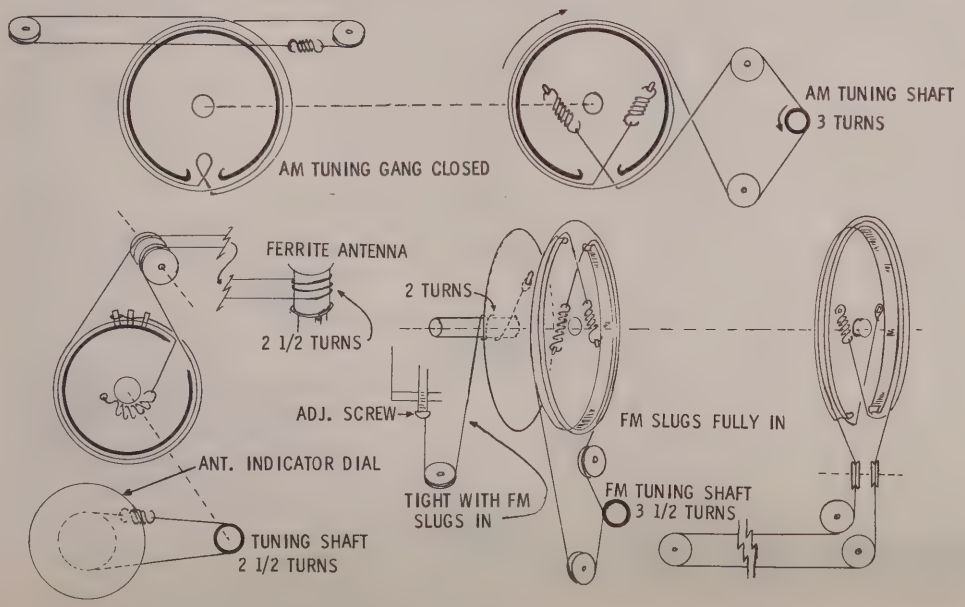
MISCELLANEOUS

ITEM No.	PART NAME	SABA PART No.	NOTES
M9	RF Tuner	5803900002	Complete, Less Tubes
M10	Tuning Cap.	5896100002	2 Section
M11	Switch Ass'y	5804501002	Pushbutton Type, Complete, Includes Music, Phono-Tape, LW, AM, SW, FM, Off-On, & Speech, also Music-Speech Solenoid
M12	Switch Ass'y		Pushbutton Type, Complete, Includes Automatic Tuning & Automatic Tuning Solenoid
M13	Switch	5803067003	Antenna
M14	Switch		AC Input Selector
M15	Switch	5895100004	Speaker
M16	Motor		Drive, Power Tuning

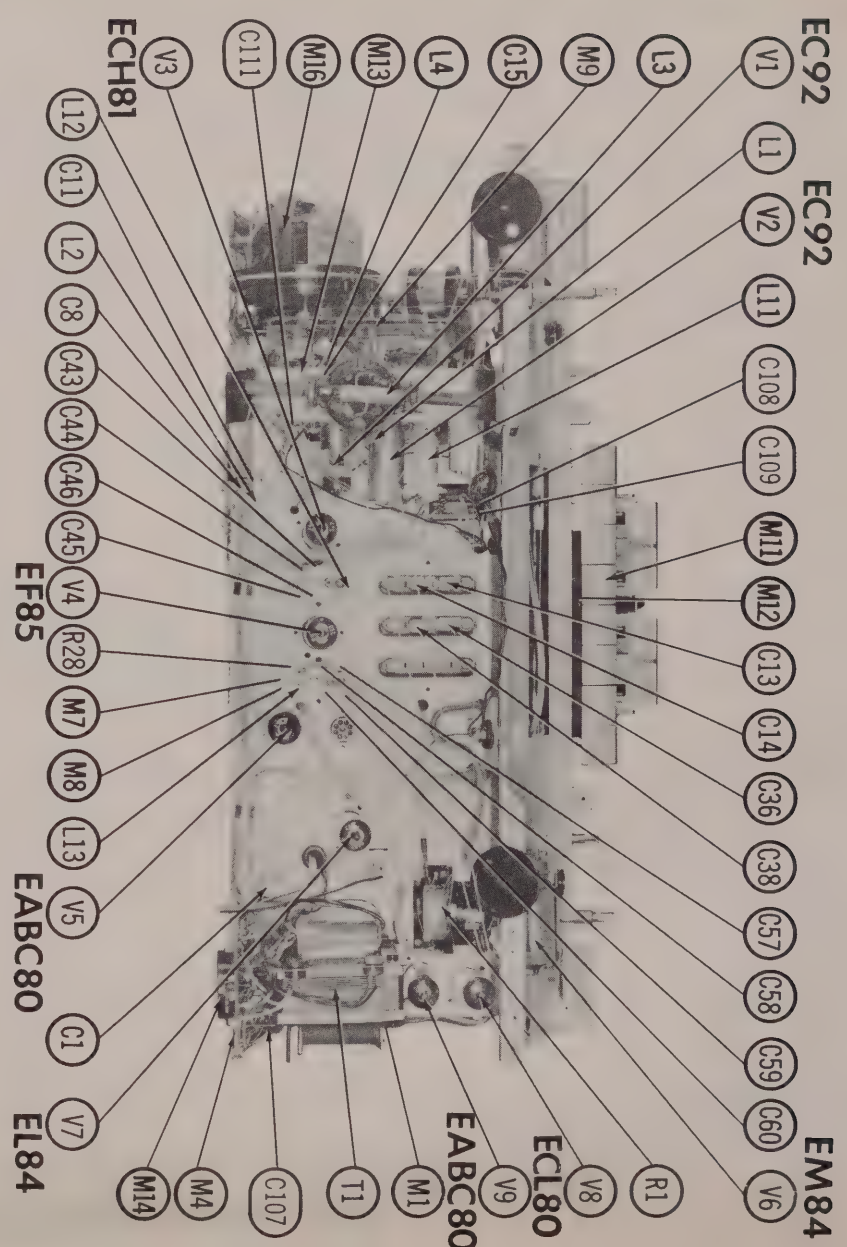
WIRING DATA

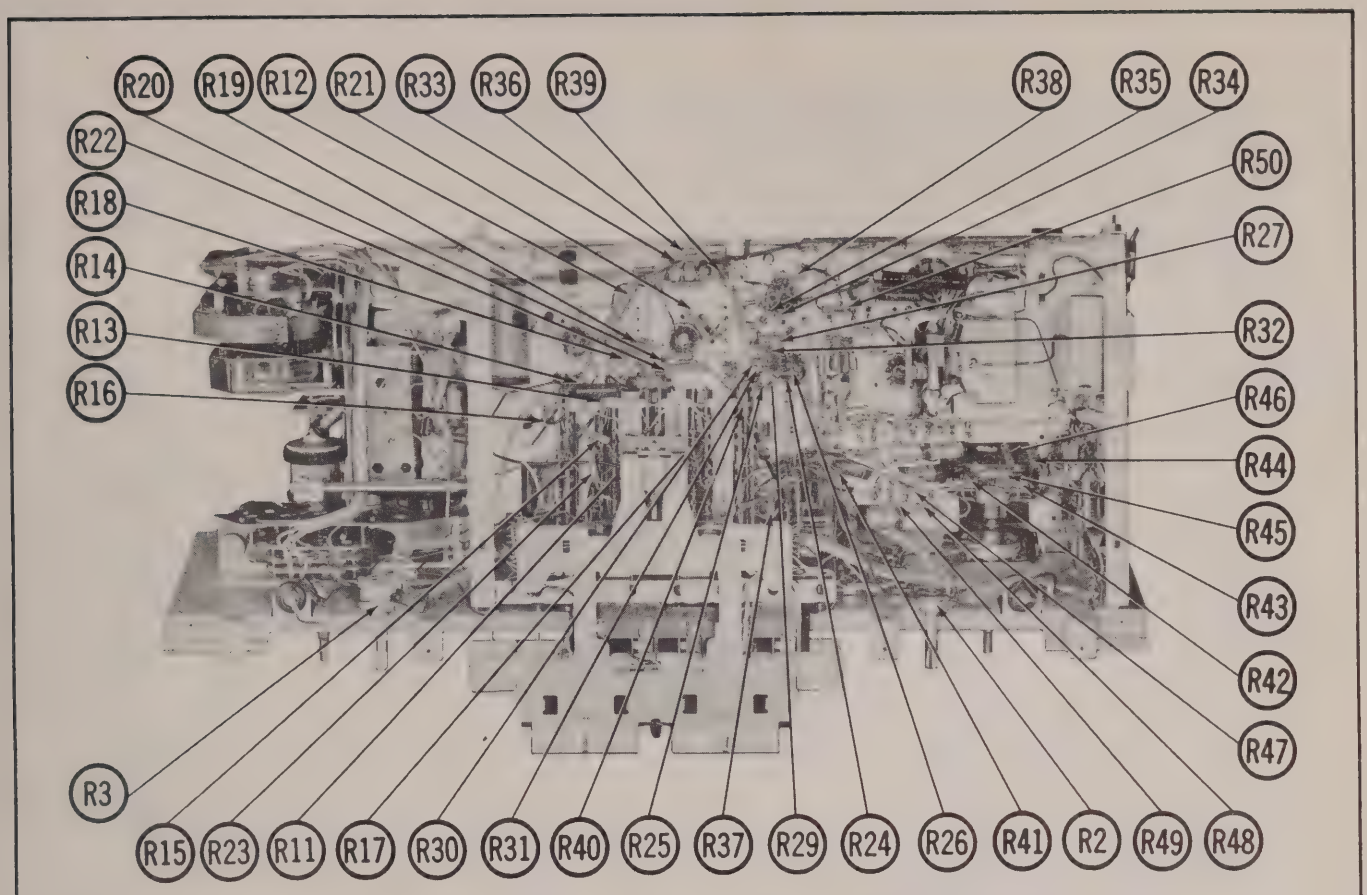
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

DIAL CORD STRINGING

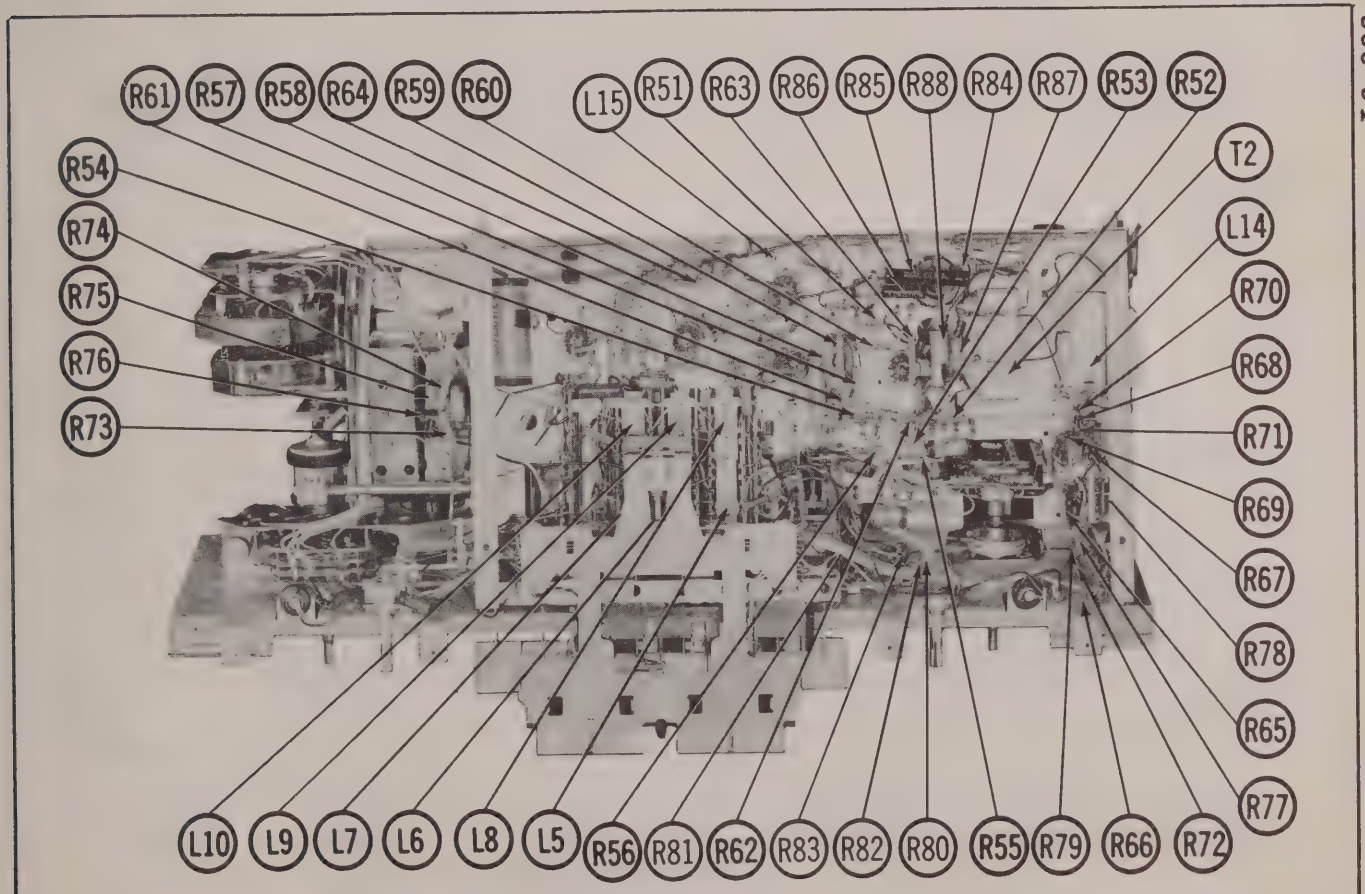


CHASSIS—TOP VIEW

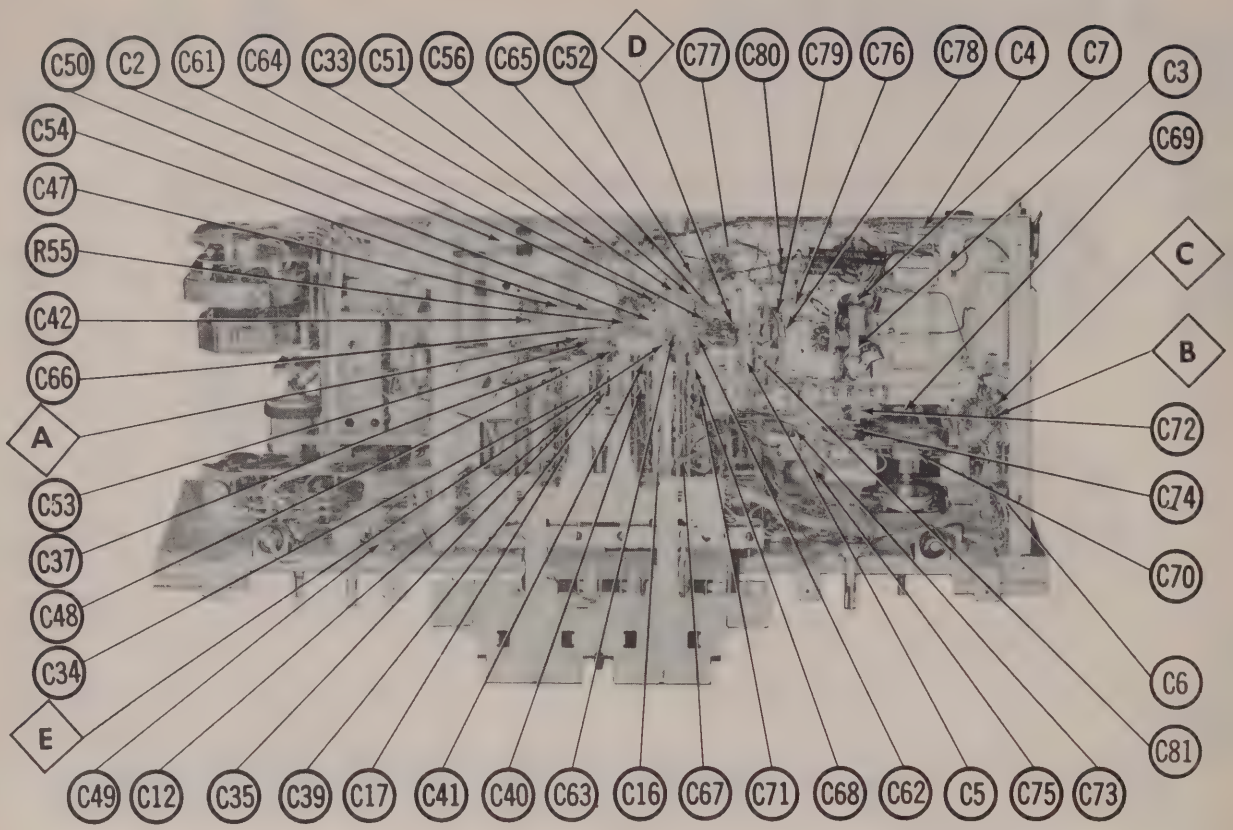




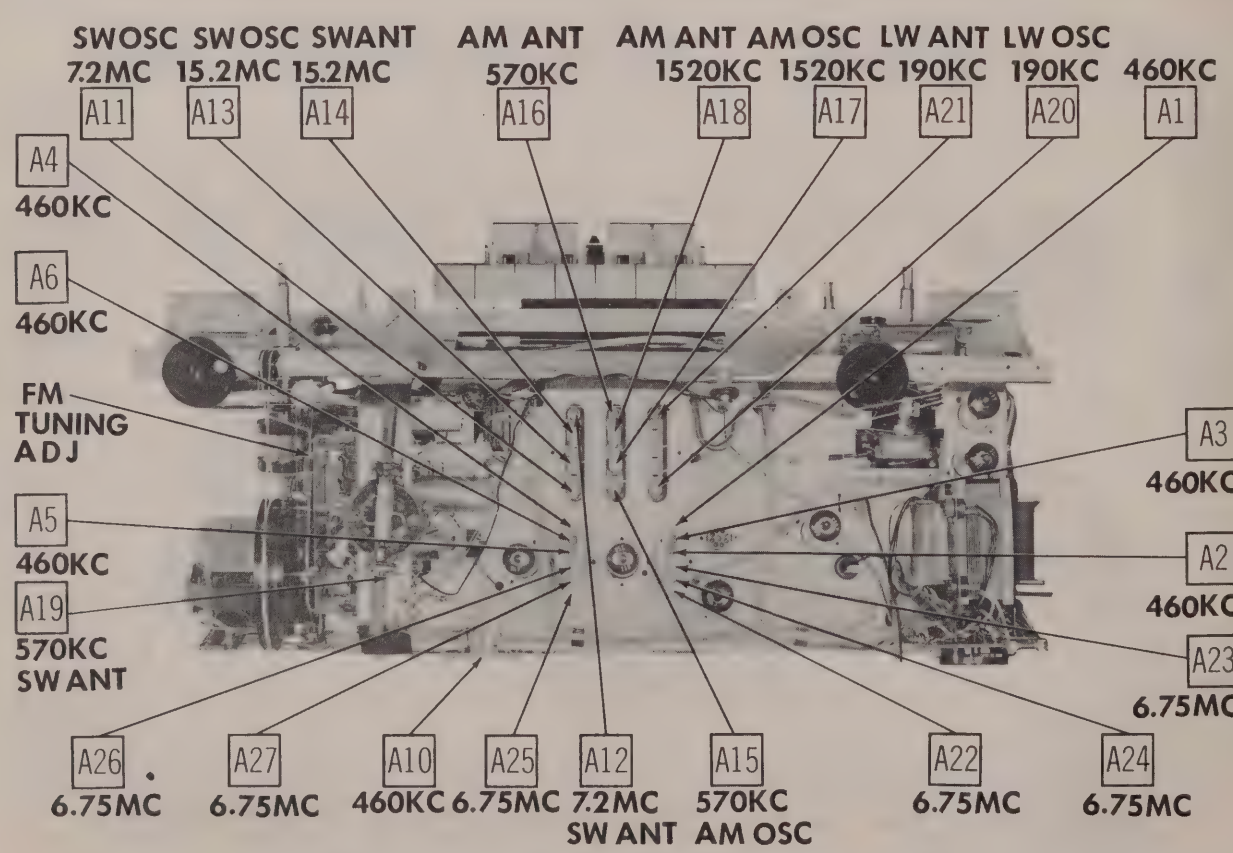
CHASSIS BOTTOM VIEW – RESISTOR IDENT. (R2-R50)



CHASSIS BOTTOM VIEW – RESISTOR (R51-R88) & INDUCTOR IDENT.



CHASSIS BOTTOM VIEW – CAPACITOR IDENT.



CHASSIS TOP VIEW – ALIGNMENT IDENT.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1 thru A12, A22 thru A35 . . . GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A13 thru A21, A36 thru A39. . GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect speaker during alignment.
Set Treble control fully counterclockwise.
Depress AM and Automatic-Off buttons.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	10000mmf	High side to pin 1 (screen) of AM Mixer. Low side to chassis.	460KC (400∿ 30% AM)	AM	High end stop	Across voice coil	A1, A2, A3	Detune A3 SLIGHTLY. Adjust A1 and A2 for maximum output. Adjust A3 for maximum, then turn counterclockwise until meter reading decreases 5%.
2.	"	"	"	"	"	"	A4, A5, A6	Detune A6 SLIGHTLY. Adjust A4 and A5 for maximum output. Adjust A6 for maximum, then turn counter-clockwise until meter reading decreases 5%.

AUTOMATIC TUNING ALIGNMENT FOR AM

Switch to "Automatic" tuning.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	10000mmf	High side to pin 1 (screen) of AM Mixer. Low side to chassis.	460KC (Unmod)	AM	High end stop	DC probe to point (B). Common to chassis. Connect a microammeter from point (C) to chassis.	A7, A8, A9	Set generator output for approximately 12 volts on VTVM. A9 is adjusted at factory and is not to be disturbed. Adjust A7 for maximum deflection on VTVM. Adjust A8 for zero reading on microammeter. A positive and negative reading will be obtained on either side of the correct setting.

AM IF TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	200mmf & 400Ω in series	Across AM antenna plug with 200mmf and 400Ω in series with high side.	460KC (400∿ 30% AM)	AM	High end stop	Across voice coil	A10	Adjust for MINIMUM output.

AM RF ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5.	Direct	High side to AM antenna terminals. (Rotary Antenna AUS (Off)).	7.2MC (400∿ Mod)	SW	7.2MC	Across voice coil	A11, A12,	Adjust for maximum output.
6.	"	"	15.2MC	"	15.2MC	"	A13, A14	"
7.		Loop (Rotary Antenna On)	570KC	AM	570KC	"	A15, A16	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
8.		"	1520KC	"	1520KC	"	A17, A18	Adjust for maximum output. Repeat steps 7 and 8, if necessary.
9.	Direct	High side to AM antenna terminals. (Rotary Antenna turned to AUS)	570KC	"	570KC	"	A19	Adjust for maximum output.
10.	"	"	190KC	LW	190KC	"	A20, A21	"

FIG. 1

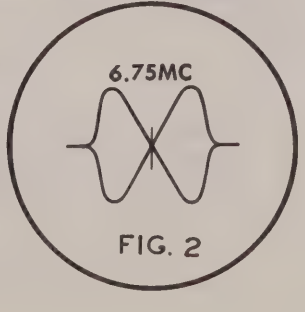


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Press "Automatic Off" switch.
Connect two matched 100K (±1%) resistors in series from point Ⓓ to chassis. The junction of these two resistors is alignment point Ⓕ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (Unmod)	FM	92MC	DC probe to point Ⓓ. Common to chassis.	A22	Detune A24 by turning counterclockwise. Adjust A22 for maximum deflection.
13.	"	"	"	"	"	DC probe to point Ⓔ. Common to point Ⓕ.	A23	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A24	Adjust for maximum deflection.
15.	"	"	"	"	"	"	A25, A26, A27	Detune A27 by turning counterclockwise. Adjust A25, A26 and A27 in numerical order for maximum deflection.
16.	"	"	"	"	"	"	A28, A29, A30	Detune A30 by turning counterclockwise. Adjust A28, A29 and A30 in numerical order for maximum deflection.
17.	"	"	"	"	"	"		Readjust A24 for MINIMUM deflection. Voltage should be approximately 10 volts. Repeat steps 12 and 13.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
12.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓓ. Low side to chassis.	A22	Disconnect the Stabilizing capacitor (C5). Detune A24 by turning counterclockwise. Adjust A22 for maximum amplitude and symmetry of response similar to Fig. 1. Reconnect C5.
13.	"	"	"	"	"	Vert. Amp. to point Ⓔ. Low side to chassis.	A23	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A22 for maximum amplitude and straightness of crossover lines.
14.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A24	Disconnect C5. Adjust for maximum amplitude and symmetry of response similar to Fig. 1.
15.	"	"	"	"	"	"	A25, A26, A27	Detune A27 by turning counterclockwise. Adjust A25, A26 and A27 in numerical order for maximum gain and symmetry.
16.	"	"	"	"	"	"	A28, A29, A30	Detune A30 by turning counterclockwise. Adjust A28, A29 and A30 in numerical order for maximum gain and symmetry.
17.	"	"	"	"	"	"		Readjust A24 for MINIMUM response. Repeat steps 12 and 13.

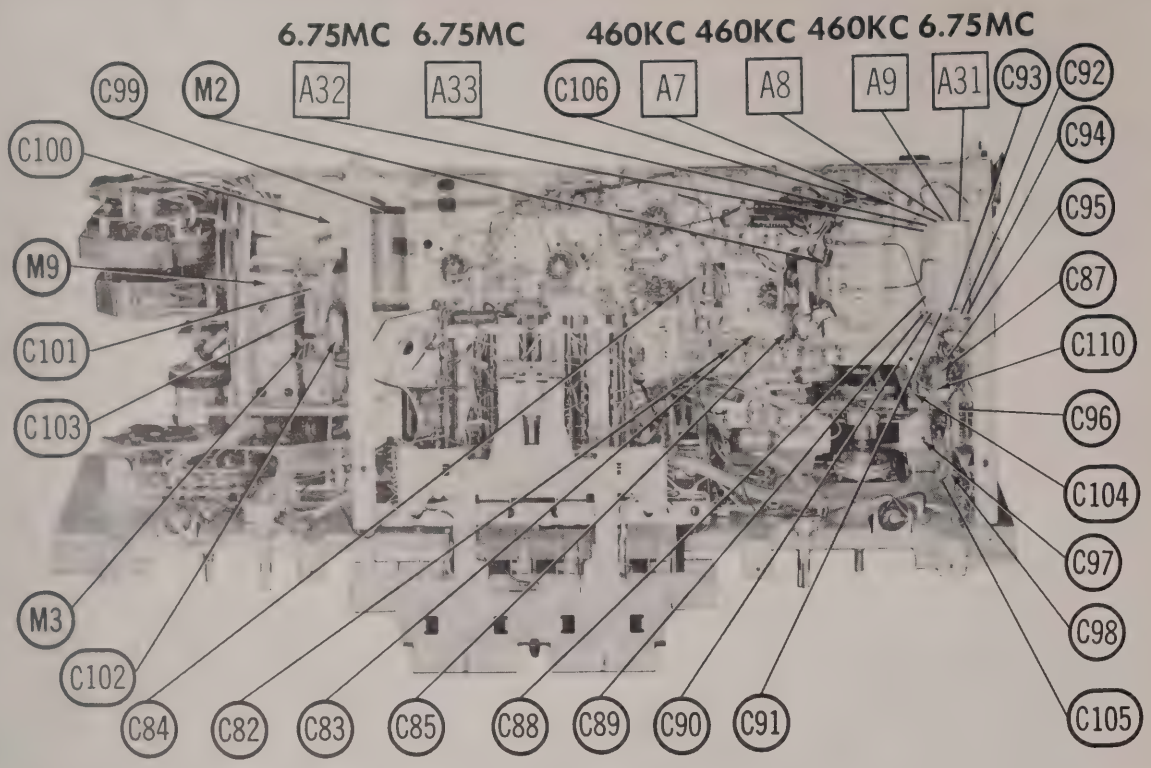
AUTOMATIC TUNING ALIGNMENT FOR FM

Switch to "Automatic" tuning.

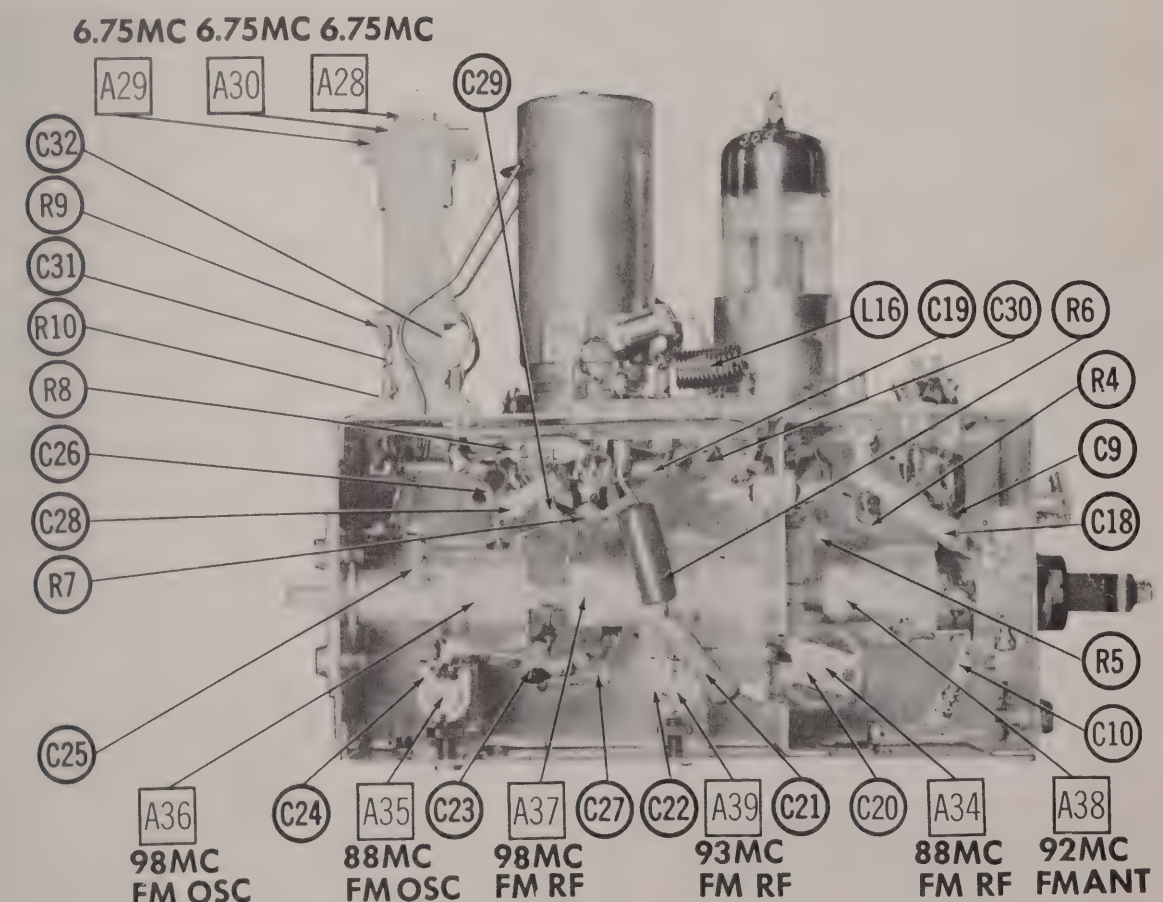
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
18.	10000mmf	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓑ. Common to chassis. Connect a DC microammeter from point Ⓒ to chassis.	A31, A32, A33	Set generator output for approximately 30 volts at point D. A33 is adjusted at the factory and is not to be adjusted. Adjust A31 for maximum deflection on VTVM. Adjust A32 for zero on microammeter. A positive and negative reading will be obtained on either side of correct setting. Repeat step 18.

FM RF ALIGNMENT

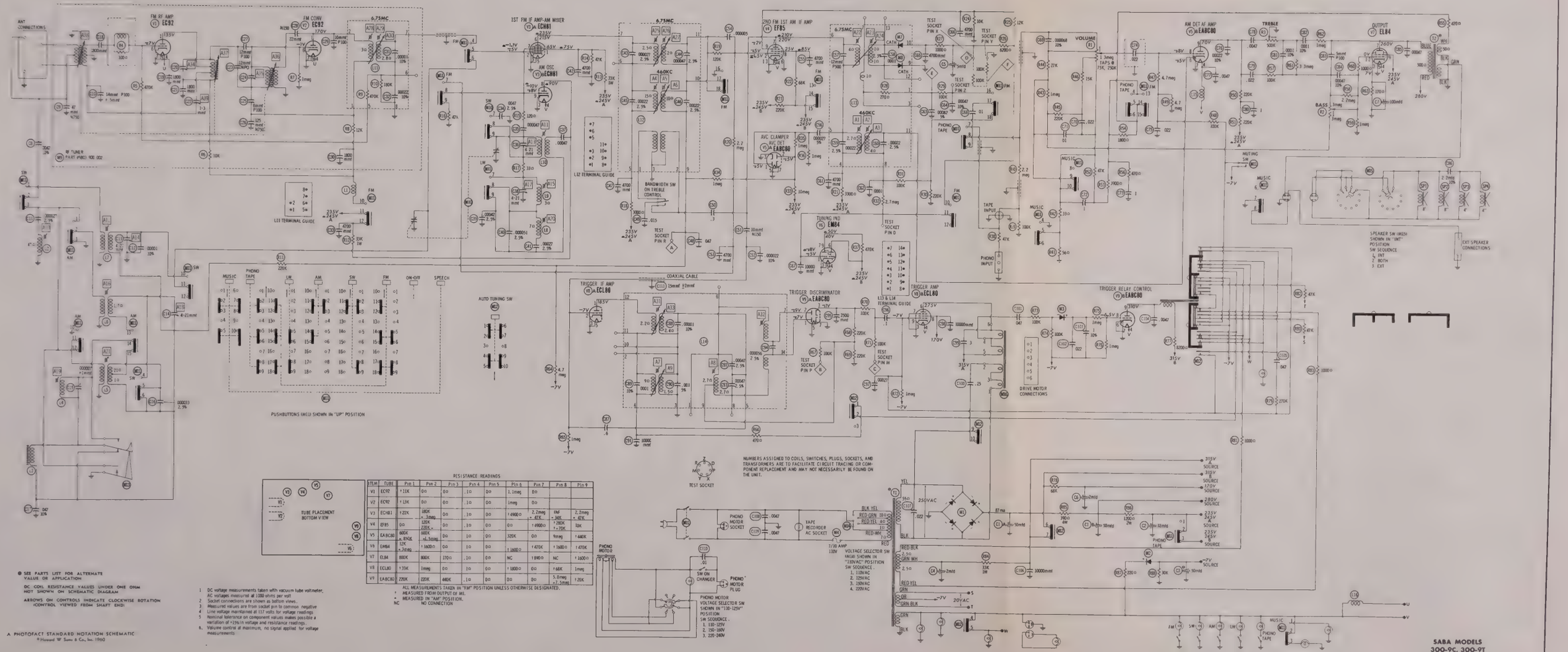
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
19.		Across FM antenna terminals.	88MC (Unmod)	FM	88MC	DC probe to point Ⓓ. Common to chassis.	A34, A35	Adjust for maximum deflection.
20.		"	98MC	"	98MC	"	FM Tuning Adjust.	"
21.		"	"	"	"	"	A36, A37	"
22.		"	92MC	"	92MC	"	A38	"
23.		"	93MC	"	93MC	"	A39	Disconnect plate voltage from FM RF Amp. Increase signal generator output to approximately .5MV. Adjust A39 for MINIMUM deflection. Reconnect plate voltage. Repeat steps 19 and 22.



CHASSIS BOTTOM VIEW – CAPACITOR, ALIGN. & MISC. IDENT.



FM RF SUBCHASSIS



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EC92	†11K	0Ω	0Ω	.1Ω	0Ω	1.1meg	0Ω		
V2	EC92	†13K	0Ω	0Ω	.1Ω	0Ω	1meg	0Ω		
V3	ECH81	†12K	180K ±.3meg	0Ω	.1Ω	0Ω	†690Ω	2.2meg ±.42K	Inf ±.34K	2.2meg ±.42K
V4	EF85	0Ω	120K 220K ±	0Ω	.1Ω	0Ω	0Ω	†690Ω	†280K ±.70K	10K
V5	EABC80	600K ±.870K	600K ±1.3meg	0Ω	.1Ω	0Ω	320K	0Ω	9meg	†440K
V6	EM84	12K ±.24meg	†160Ω	0Ω	.1Ω	0Ω	†470K	†160Ω	†470K	†470K
V7	EL84	800K	800K	170Ω	.1Ω	0Ω	NC	†890Ω	NC	†160Ω
V8	ECL80	†13K	1meg	0Ω	.1Ω	0Ω	†160Ω	0Ω	†68K	1meg
V9	EABC80	220K	220K	440K	.1Ω	0Ω	0Ω	0Ω	5.6meg ±.5meg	†20K

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF M1.
* MEASURED IN "AM" POSITION.
NC NO CONNECTION

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SABA MODELS 300-9C, 300-9T

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 55, 56, 63, 64
(Ch. 528.53510, 528.53520)

SILVERTONE MODELS 55, 56, 63, 64
(Ch. 528.53510, 528.53520)

MODEL 63

TRADE NAME	Silvertone Models 55, 56 (Ch. 528.53510); 63, 64 (Ch. 528.53520)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 6 Tube AM Receiver With 4 Speed Automatic Stereo Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	34 Watts, .38 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	532 - 1630KC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR SILVERTONE 528.56310 - PHOTOFACT SET 417 FOLDER 10

ALIGNMENT INSTRUCTIONS

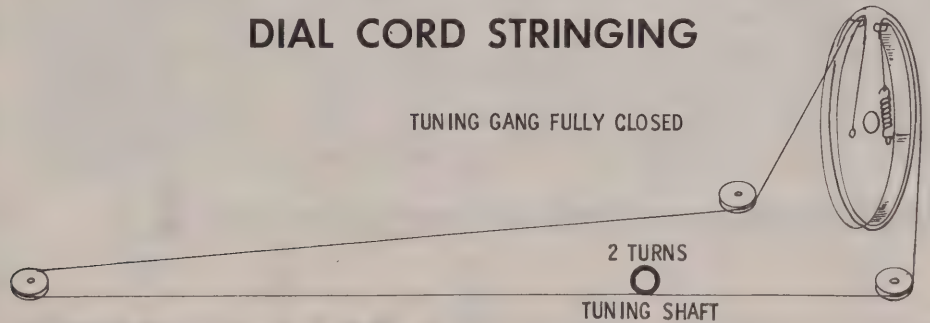
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A5, A7 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A6 ..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1630KC	"	"	A5	"
3.	"	"	532KC	Tuning gang fully closed.	"	A6	Adjust for maximum output. Repeat steps 2 and 3.
4.		Loop	1400KC	Tune to 1400KC signal	"	A7	Adjust for maximum output while rocking tuning gang.

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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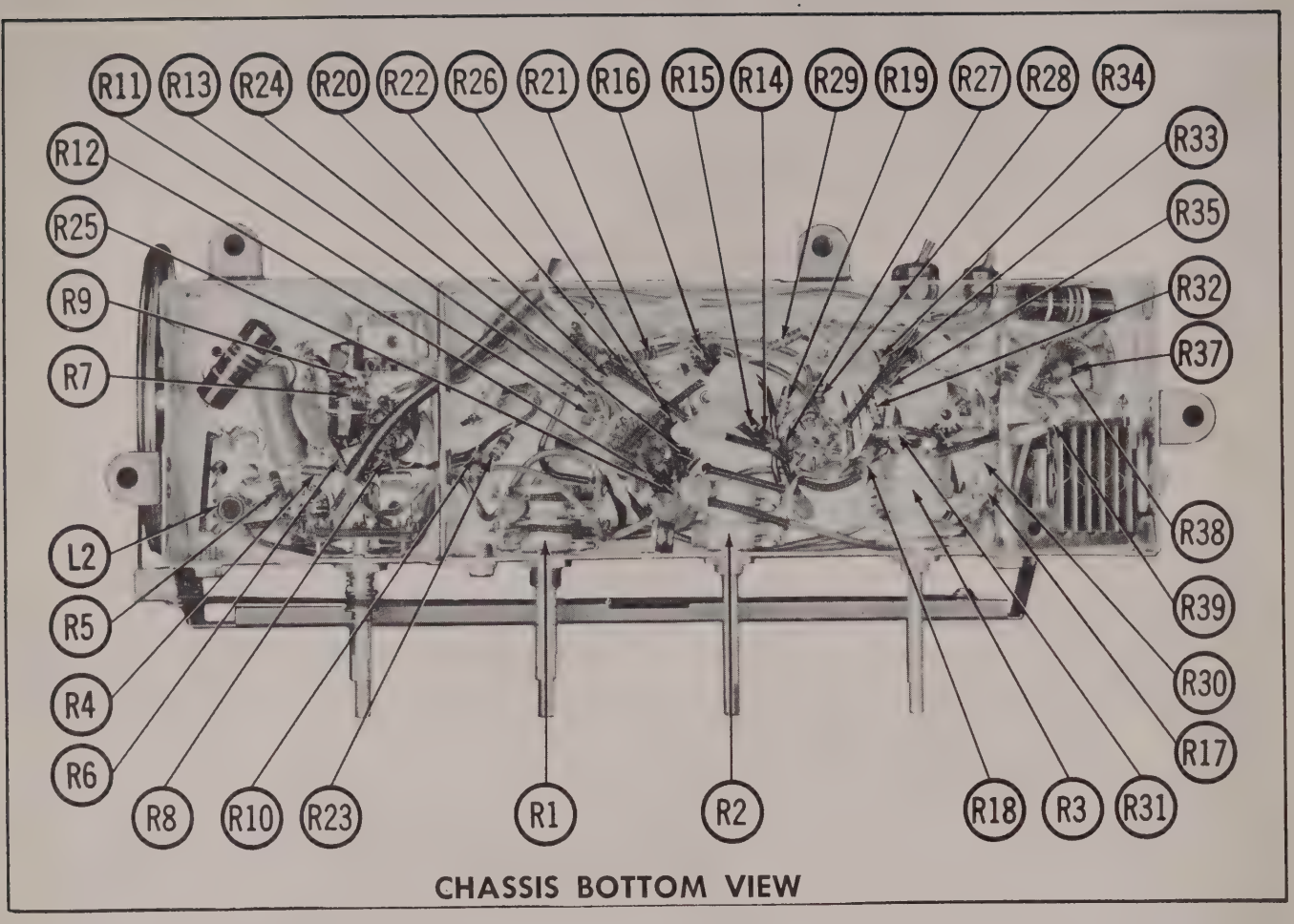
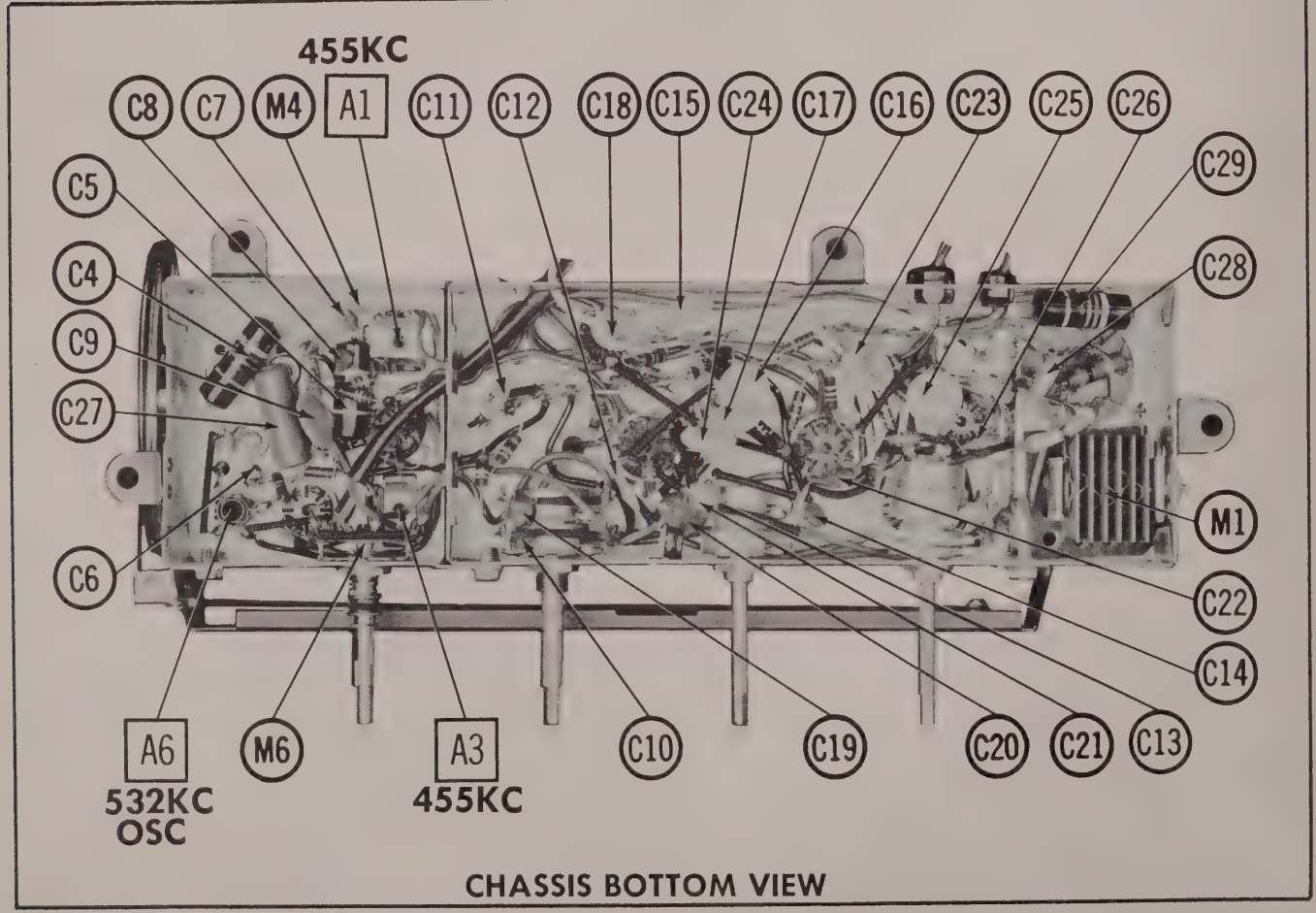
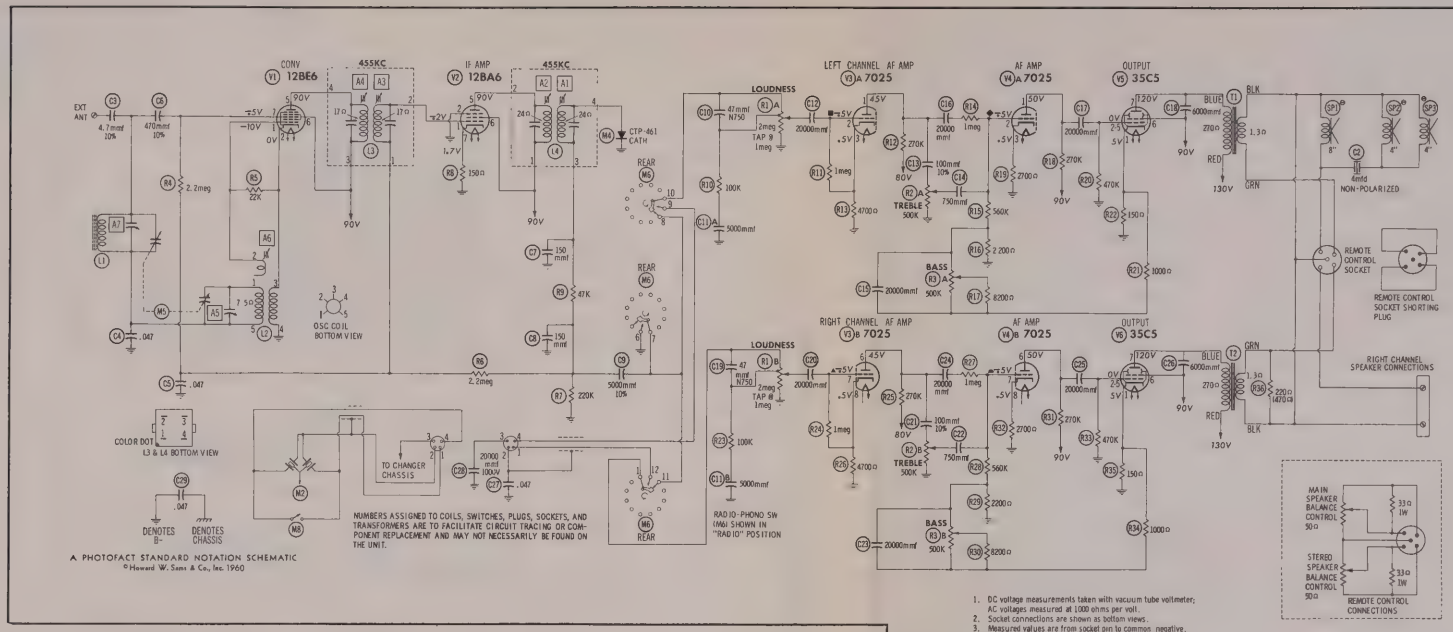


CHASSIS BOTTOM VIEW



CHASSIS BOTTOM VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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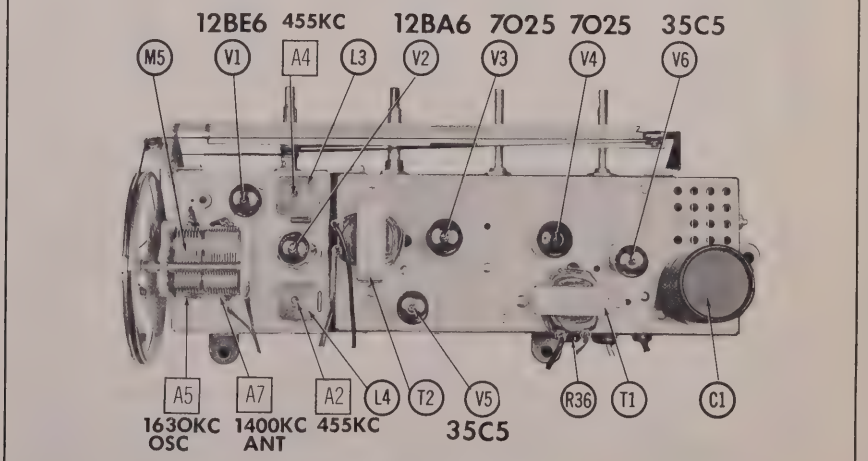
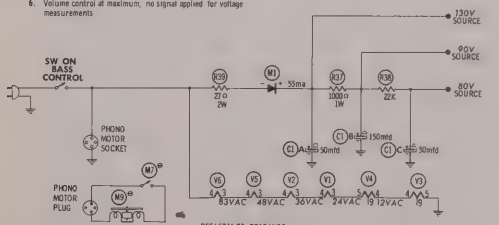
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements



CHASSIS-TOP VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BE6	22K	.8Ω	24Ω	36Ω	↑1000Ω	↑1000Ω	4.6meg		
V2	12BA6	2.4meg	0Ω	36Ω	48Ω	↑1000Ω	↑1000Ω	150Ω		
V3	7025	↑290K	1meg	4700Ω	12Ω	0Ω	↑290K	1meg	4700Ω	6Ω
V4	7025	↑270K	560K	2700Ω	12Ω	24Ω	↑270K	560K	2700Ω	18Ω
V5	35C5	150Ω	470K	48Ω	83Ω	470K	↑1000Ω	↑270Ω		
V6	35C5	150Ω	470K	83Ω	118Ω	470K	↑1000Ω	↑270Ω		

† MEASURED FROM OUTPUT OF M1.
■ MEASURED FROM PIN 3 OF V3.
▲ MEASURED FROM PIN 8 OF V3.
• MEASURED FROM PIN 4 OF V4.
• MEASURED FROM PIN 8 OF V4.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

SILVERTONE MODELS 55, 56, 63, 64
(Ch. 528.53510, 528.53520)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Left Channel AF Amp. - Right Channel AF Amp.	7025
V2	IF Amplifier	12BA6	V5	Left Channel Output	35C5
V3	Left Channel AF Amp. - Right Channel AF Amp.	7025	V6	Right Channel Output	35C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■50	150	18-40-3	AFH3-26	D0014	FP240	TMD-13	TVLS-3449.1*	
B	▲150	150				TC495	TD-150-150		
C	▲50	150							
C2	4	150	18-9-5	NP-PRS7750	BBR8-150 †	TCN510		TVAS-1402.1	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C7	150		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C8	150		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C9	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D5
C10	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCC-Q47
C11A	5000		BPD-2X0047	DD3-502	BYD6DD5	CCD-502	B2X250	5HK-2D47
B	5000					CCD-502		
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C13	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C14	750		DI-750	DD-751	L10T75	CCD-751	GP375	10TS-T75
C15	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C16	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C17	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C18	6000		DAC-22	DD16-602	HVE16D6	6DP-1-602	B-260	BL-D60
C19	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C20	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C21	100 10%		DI-100	DD-101	L10T1	CCD-101	GP310	10TS-T10
C22	750		DI-750	DD-751	L10T75	CCD-751	GP375	10TS-T75
C23	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C24	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C25	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C26	6000		DAC-22	DD16-602	HVE16D6	6DP-1-602	B-260	BL-D60
C27	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C28	20000 1000V		BPD-02	DD-203	CUB10S2	16DP-4-203	B-120	5HK-S20
C29	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg	½	24-339-0					Loudness, Left Channel
	1meg tap							
B	2meg	½						Loudness, Right Channel
	1meg tap							
R2A	500K	½	24-191-2	AB-60	AD47-500K-Z	Q13-133		Treble, Left Channel
B	500K	½		SR-60	Not Req.	M13-133		Treble, Right Channel
C	Shaft			AK-8	RS-3/16	NQ		
R3A	500K	½	24-190-2	AB-60	AD47-500K-Z	Q13-133		Bass, Left Channel
B	500K	½		SR-60	Not Req.	M13-133		Bass, Right Channel
C	Shaft			AK-8	RS-3/16	NQ		
D	Switch			KR-1	SWE-12	76-1		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	2.2meg	
R5	22K	
R6	2.2meg	
R7	220K	
R8	150Ω	

ITEM No.	RATING	REMARKS
R9	47K	
R10	100K	
R11	1meg	
R12	270K	
R13	4700Ω	

ITEM No.	RATING	REMARKS
R14	1meg	
R15	560K	
R16	2200Ω	
R17	8200Ω	
R18	270K	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING	REMARKS
R19	2700Ω	
R20	470K	
R21	1000Ω	
R22	150Ω	
R23	100K	
R24	1meg	
R25	270K	

ITEM No.	RATING	REMARKS
R26	4700Ω	
R27	1meg	
R28	560K	
R29	2200Ω	
R30	8200Ω	
R31	270K	
R32	2700Ω	

ITEM No.	RATING	REMARKS
R33	470K	
R34	1000Ω	
R35	150Ω	
R36	220Ω	(470Ω) *
R37	1000Ω 1W	
R38	22K	
R39	27Ω 2W	#61-145-0

* Alternate Value, Chassis 528.53510.

\# Silvertone Part Number.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	84-7256 †						
L2	Osc. Coil	10-50-4			BC-393			
L3	Input IF	10-108-2	16-6758	16-6758	BC-352	12-C1	RF-1	
L4	Output IF	10-110-2	16-6758	16-6758	BC-353	12-C2	RF-2	

† Includes Trimmer.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	6-8Ω	80-78-1	22S86	A-2902 ①	AU-604 ①	A-3849 ①	22S86		
T2	2700Ω	6-8Ω	80-78-1	22S86	A-2902 ①	AU-604 ①	A-3849 ①	22S86		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	8"	PM	6-8Ω	33-411-4 ①	8A1Z7.9	① Models 63, 64
SP2	4"	PM	6-8Ω	33-299-4 ①	4A1Z7.7	② Two used, Models 55, 56
SP3	4"	PM	6-8Ω	33-299-4 ①	4A1Z7.7	
	5" x 7"	PM		33-409-4 ②		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.056A	86-15-3 ①	RS150 ①	1235AH ①	150 ①	SR200 ②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	33-311-0	13TB *	Not Req.	26S *	Not Req.			* 8TA4-S or * 8TA4-D	N-8TA-S

* Includes Mount

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	83-125-0 † (78RPM)	W-10STS † or W-101STD ♦	E98 † or E98D ♦	† Jewel ♦ Diamond
	83-1252 † (LP)	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	CTP-461		1N60	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M5	Tuning Cap.	19-78-2	2 Gang (Ant. 13-343mmf, Osc. 16-120mmf)
M6	Switch	69-287-0	Function (Radio-Phono)
M7	Switch	84-7838	Off-On (Part of Changer 528. 56662, 663)
		84-6552	Off-On (Part of Changer 528. 56660, 661)
M8	Switch	69-282-0	Stereo-Monaural (Part of Changer)
M9	Motor	59-72	Changer Chassis 528. 56660, 662
	Motor	59-89	Changer Chassis 528. 56663, 666

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1109-0	Tuning
Knob	52-1266-0	Loudness
Knob	52-1144-0	Off-On Bass, Treble
Knob	52-1245-0	Stereo Balance
Knob	52-1132-0	Function (Radio-Phono)
Knob	52-1237-0	Off-On, Reject
Knob	52-1238-0	Speed Control
Window	48-164-1	Dial Scale
Pointer	52-214-1	
Cabinet	42-119-3	Model 63
Cabinet Lid	21-518-0	Model 55
Cabinet	42-120-3	Model 64
Cabinet Lid	21-519-0	Model 56
Cabinet	42-113-3	Model 55
Cabinet	42-36-4	Speaker, Enclosure Model 55
Cabinet	42-114-3	Model 56
Cabinet	42-37-4	Speaker Enclosure Model 56
Leg	49-499	Model 63
Leg	49-500	Model 64

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODEL 232
(Ch. 528.58120, 528.59490, 528.59500)

SILVERTONE MODEL 232
(Ch. 528.58120, 528.59490, 528.59500)

GENERAL INFORMATION

Silvertone Model 232 tape recorders play back and record two-track and four-track monaural tapes, and play back (but do not record) two-track and four-track prerecorded stereo tapes.

Any size reel up to 7 inches can be used. A Record-Level indicator on the unit provides the correct recording volume setting.

The erase head is automatically positioned when the unit is in the Record position, so that new recordings can be made on a previously recorded tape. Recordings can be made from a radio, television receiver, or phonograph, in addition to those made directly from a microphone.

The tape recorder records and plays back at two speeds, 7 1/2 and 3 3/4 ips.

With a two-track monaural recording, recording times for both tracks are as follows:

Reel Size	3 3/4 Ips	7 1/2 Ips
5" (600 ft.)	1 Hour	1/2 Hour
7" (1200 ft.)	2 Hours	1 Hour

The Model 232 operates on 110-117 volts, 60 cycles AC only. Before connecting unit to line supply, be certain the supply agrees with the foregoing specifications.

Manufactured by:

Sears, Roebuck and Company
925 South Homan Ave.
Chicago 7, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS 6, INDIANA

C412

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FUNCTIONS OF CONTROLS, INDICATORS, SWITCHES, AND RECEPTACLES

Speed Control

Raise knob for 3 3/4 ips; depress knob for 7 1/2 ips. This control also actuates the equalization switch.
CAUTION: Do not move the Speed Control unless the Off-On-Tone control is in the On position.

Off-On-Tone Control

Turns the recorder on and off, and varies the tone from bass (counterclockwise) to treble (clockwise) during playback.

Volume Control

Regulates the volume for both recording and playback.

Play-Record Control

Operates the tape mechanism, and sets the amplifier for recording or playback. When the Play-Record control is in the neutral position, the tape transport mechanism is disengaged (will neither record nor play back the tape). Turning the Play-Record control to the right places the unit in the Play position. Pushing the Play-Record control down and turning it to the right at the same time, until it locks in place, puts the unit in the Record position.

Fast Rewind Control

The Fast Rewind control (right-hand knob) winds the tape onto the feed reel at a high speed. Always place the Play-Record control in the idle position before moving the Fast Rewind control.

Fast Forward Control

The Fast Forward control (left-hand knob) winds the tape onto the take-up reel at a high speed. Always place the Play-Record control in the idle position before moving the Fast Forward control.

Track Selector Switch

Selects the portion of the tape on which monaural sound will be recorded, or from which prerecorded monaural or stereo sound will be played back. This is a three-position switch: the Stereo position is for playback of commercial prerecorded stereo tapes, either the standard two-track or the four-track stereo; the A_2B_2 position is for four-track monaural recording and playback; and the A_1B_1 position is for two-track monaural recording and playback.

Recording Level Indicator

A neon light that indicates the level at which the Volume control should be set during a recording. For undistorted reproduction, set the Volume control, during a recording, so that the light flashes on the loudest sound only.

Mike Jack

The microphone input for recording.

Radio-Phono Jack

For recording from a radio, record player, or changer. May also be used as a public-address unit through which records can be played.

Time Indicator

The time markings printed on the top plate, under the reels, indicate the approximate number of minutes of tape wound on the take-up reel and the minutes of tape left on the feed reel. This information is useful for editing recordings. By making notations during a recording, the operator can find any desired selections during playback.

OPERATING INSTRUCTIONS

Threading the Tape

1. Place a reel of tape on the right reel plate and an empty reel on the left reel plate, making certain the reel slots engage the protrusions on the reel plates.
2. Turn the Play-Record control, in the center of the recorder, fully counterclockwise.
3. Unwind about 10 inches of tape from the reel. Hold a section of the tape straight with both hands, and insert it into the tape slot, making certain the dull-coated side faces the rear of the recorder.
4. Insert the free end of the tape into one of the three radial slots in the hub of the take-up reel. Turn the reel several turns clockwise, until the tape is secured to the reel and all slack is taken up between the reels.

To Record From a Microphone (Monaural Two-Track)

1. Thread the tape as described under "Threading the Tape."
2. Turn the recorder on, and adjust the Speed control for the desired speed.
3. Plug the microphone into the Mike jack.
4. Set the Track Selector switch to the A_1B_1 position.
5. Push the Play-Record knob down. At the same time, turn it to the Record position. The tape will now begin moving.
6. Hold the microphone 6 to 12 inches from the mouth, and speak in a normal voice. Adjust the volume for the correct level. (Recording

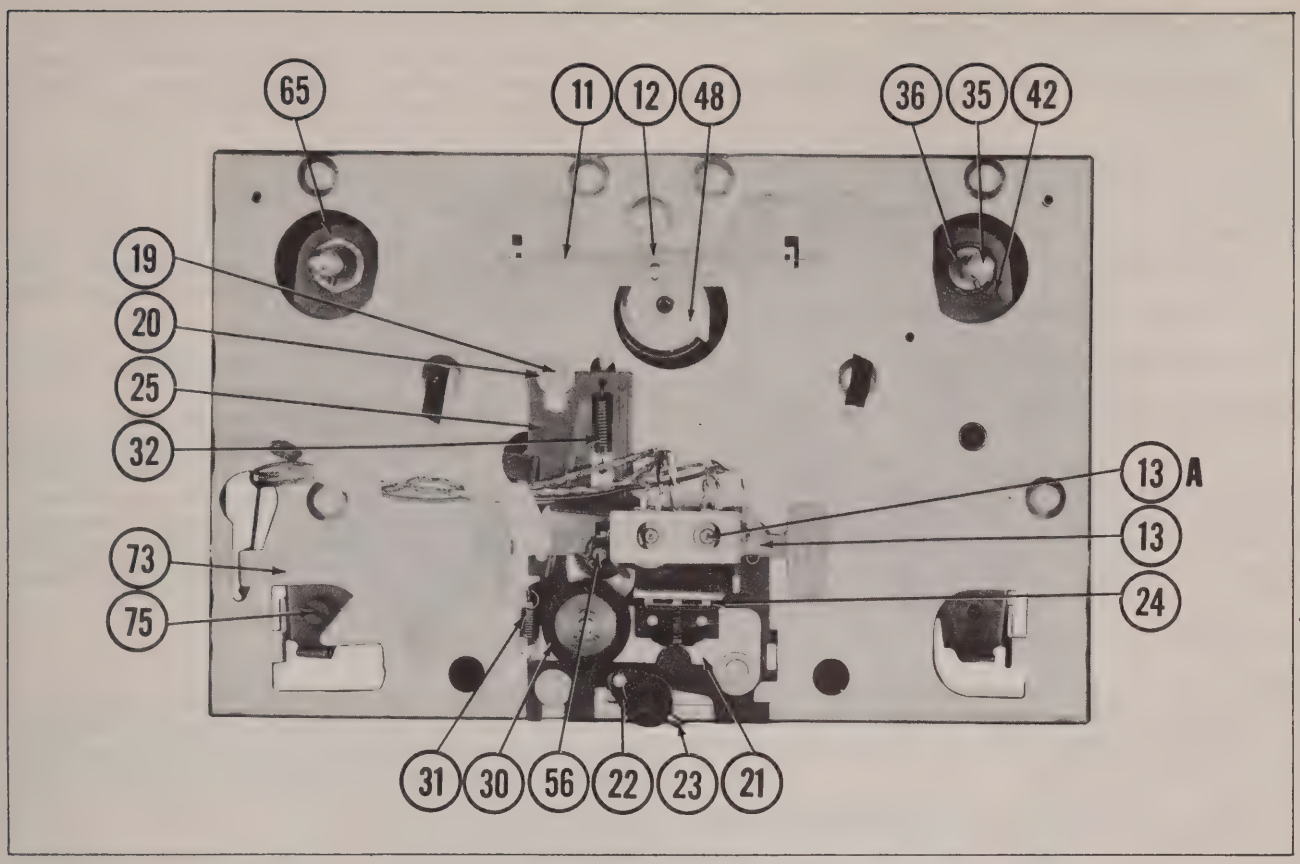


FIG. 1 TOP VIEW OF MECHANISM WITH ESCUTCHEON REMOVED.

Level indicator light should just flash during the loudest sound passages.)

7. To stop recording, turn the Play-Record knob to the idle position.

8. To record on the other half of the tape, reverse the reels and turn the tape over. Then repeat the previous seven steps.

NOTE: Correct volume level on a recording is important. Too weak a signal, which does not cause flashing on the Recording Level indicator, will result in weak playback. Too strong a signal, which causes the Recording Level indicator to glow continuously, will result in distortion during playback.

To Record From a Radio or TV

Recordings can be made from a radio or TV by one of three methods:

1. Place the microphone about 6 to 12 inches in front of the radio or TV speaker. Turn the radio or TV volume control to a normal level. (Setting it too high will cause distortion.) Turn the radio or TV tone control to maximum treble. Set the recording level, and record as described under "To Record From a Microphone". This type of recording may not be too satisfactory, because other sounds may be picked up by the microphone and recorded on the tape.

2. Use speaker cable made up of a 2-conductor phone plug on one end and two alligator clips on the other end. Connect the alligator clips across the voice-coil terminals on the radio or TV speaker, and insert the cord plug into the Radio-Phono jack. Set the radio or TV volume and tone controls as described previously. Set the recording level, and proceed as described under "To Record From a Microphone."

3. Use a shielded cable with a 2-conductor phone plug on one end. Connect the other end across the radio or TV volume control. Insert the phone plug into the Radio-Phono jack. Set the recording level, and proceed with the recording as described under "To Record From a Microphone." The positions of the radio or TV volume and tone controls have no effect on this setup, and may, thus be set anywhere.

To Record From a Phonograph

1. If the phonograph being used has a phone-type plug on the pickup leads, insert it into the Radio-Phono jack. Set the recording level, and proceed with the recording as described under "To Record From a Microphone."

2. If the phonograph has the more common pin-type plug, an adaptor will be needed. Insert the pin plug into the adaptor, and plug the adaptor into the Radio-Phono jack.

To Play Back Monaural Recordings

1. Thread the tape as described under "Threading the Tape."
2. Turn the recorder on. Adjust the Speed control for the correct speed.
3. Set the Track Selector switch to the A_1B_1 (monaural) position.
4. Turn the Play-Record knob to the Play position.
5. Adjust the volume and tone to suit.

Erasing Recorded Material

In the record position, any recording on the tape is automatically erased before a new one is made. To erase a recording without putting anything on the tape, follow the normal recording procedure, but leave the Volume control at its extreme counterclockwise position.

To Play Back Stereo Recordings

NOTE: Setting of the controls is the same for stereo as for monaural playback, except that the two additional controls on the external speaker-amplifier are used.

1. Thread the stereo tape as described under "Threading the Tape."
2. Turn both the main amplifier and the external speaker-amplifier to the On position.
3. Turn the Track Selector switch to the Stereo position.
4. Plug the cable running from the external speaker-amplifier into the Output jack on the left side of the tape recorder.
5. Turn the Play-Record knob to the right, but do not push it down.
6. Adjust the volume and tone to suit.

NOTE: This tape recorder cannot record stereo tape.

To Make Quarter-Track (Monaural) Recordings

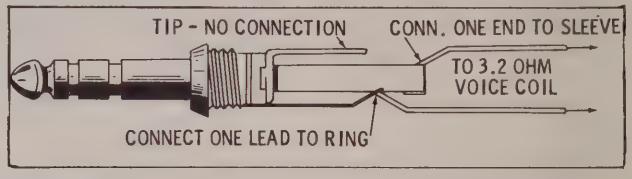
1. Thread tape as described under "Threading the Tape"; both the full reel and the empty reel should have Side One up.
2. Turn the Track Selector switch to the A_1B_1 position. Following standard recording instructions, record through the entire length of tape. Each track of recording should be identified on the reel at this time. (Example: Track No. 1, Music.)
3. Remove the full reel of tape from the left spindle, turn it over, and place it on the right spindle. Place the empty reel on the left spindle. Both reels should have Side Two up. Record the entire length of tape, label reel "track No. 2, and identify.
4. Remove the recorded tape from the left spindle, turn it over, and place it on the right spindle. Place the empty reel on the left spindle. Both reels should have Side One up. Turn the Track Selector switch to the A_2B_2 position. Record the entire length of tape, label the reel "track No. 3", and identify.
5. Remove the recorded tape from the left-hand spindle, turn it over, and place it on the right-hand spindle. Place the empty reel on the left-hand spindle. Both reels should have Side Two up. Record the entire length of tape, label reel track No. 4, and identify.

To Play Back Quarter-Track (Monaural) Recordings

Track 1 and 3 are played with Side One of the supply reel up. Either track to be played may be selected by the Track Selector switch. To play track 2 or 4 before playing 1 or 3, thread the tape and depress the Fast Forward knob. This rapidly winds the tape onto the take-up reel. Reverse the reels with Side Two up, and turn the Track Selector switch to the desired track.

To Use an External Speaker

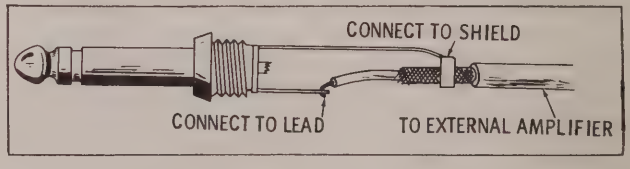
For proper operation, the 8-ohm impedance should be matched with an 8-ohm speaker. Plug the external speaker through a 3-conductor plug into the Output jack. Connect the 3-conductor plug as shown in the drawing below. The internal speaker is cut off when this system is used.



CAUTION: Do not insert the plug into the recorder unless the external speaker is attached, because the output tube, transformer, and tone control will be damaged.

To Use an External Amplifier

Plug the external amplifier into the Output jack through a 2-conductor plug connected as shown in the drawing below.



To Edit and Splice Tape

NOTE: Since it is impossible to edit and splice one track without affecting the others, recordings to be edited should be limited to one track only.

1. Tape may be edited by cutting out unwanted portions or by joining selections into another sequence. Announcements, etc., can be inserted between selections. Unused tape can be spliced for re-use.
2. For best results, cut the tape at a slight diagonal, join the ends together with a butt joint, and fasten on the glossy side with splicing tape. Trim off any excessive width.

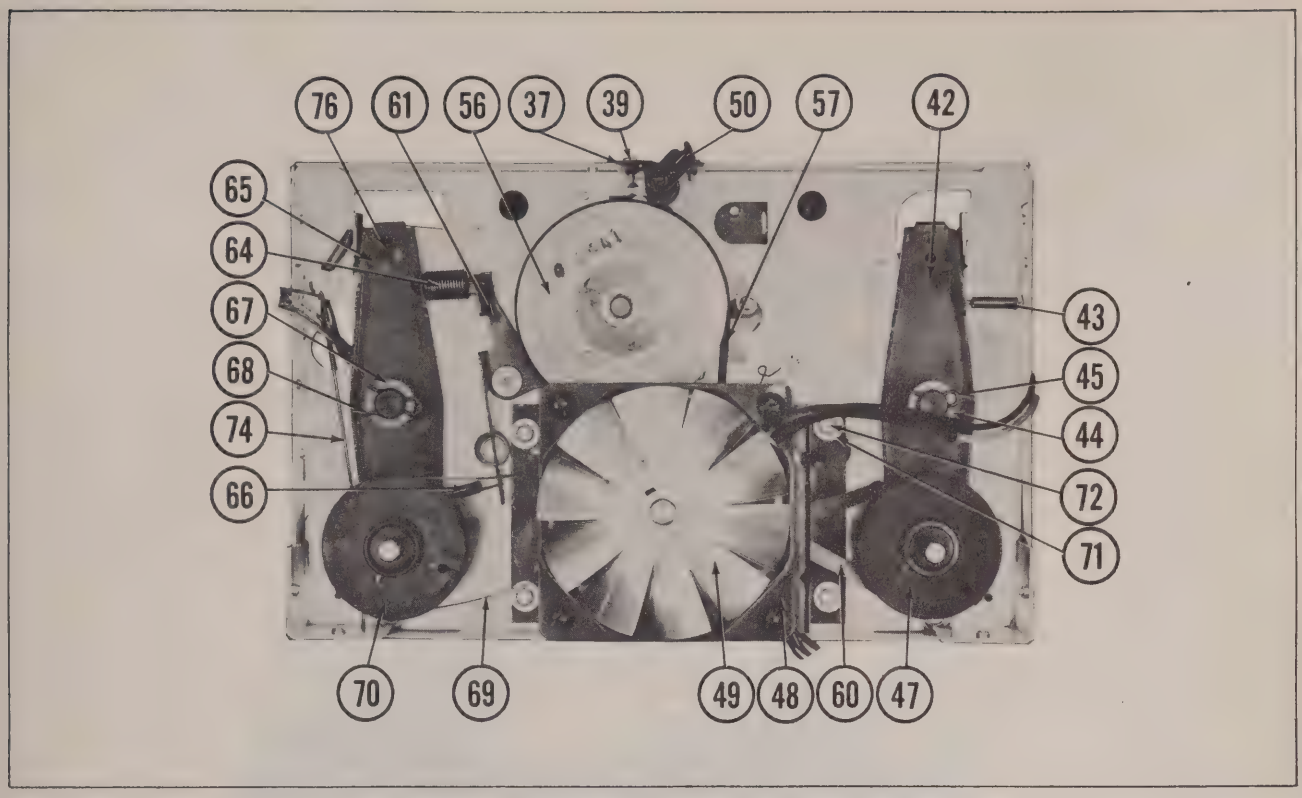


FIG. 2 BOTTOM VIEW OF MECHANISM.

DISASSEMBLY INSTRUCTIONS

All servicing requires removal of the unit from the carrying case, with the following exceptions: cleaning and aligning of head and bracket assembly (13), pressure roller (30), and pressure shoe and pad assembly (24).

To remove the tape transport mechanism and amplifier assembly from the case: Remove the four Phillips head mounting screws and their washers at the bottom of the cabinet. Partially lift the unit from the case. Disconnect the speaker leads from the speaker. Remove the unit from case.

To replace the tubes, remove the six Phillips screws and the small panel on the bottom of the cabinet.

To reassemble, reverse the foregoing procedure.

ADJUSTMENTS

Spindle End-Play Adjustment

Spindles (35) should have from 1/32 to 1/16 inch of up and down movement. To adjust, loosen set screw (46) on the spindle to be adjusted, and move spindle pulley (47) or (70) up or down as required, until the end play is correct.

Take-Up and Feed-Reel Drag Adjustments

When the Play-Record control is placed in the neutral position, the reels should stop promptly, with a minimum of overrun and no looping of the tape. When the Play-Record control is in the neutral position and no reels are on reel plates (5), the reel plates may revolve slightly; but once the reels are in place, they should not revolve.

Stops (labeled C and D on the Exploded View) on motorboard (17) control the foregoing action. They regulate the amount that take-up reel arm (65) or feed reel arm (42) returns after the Fast Forward and Fast Rewind knob has been released. Insufficient return would cause continued fast rewind or fast forward operation; too much return would not allow drive belts (60) or (69) to place a drag on their respective pulleys. Bend these stops carefully in order to obtain the foregoing operation. Stop C controls the take-up side, and stop D, the rewind side.

Take-up Lever Adjustment

Take-up spring (64) on take-up reel arm (65) controls the timing of left reel plate (5). When the Play-Record control is in the Play position, the take-up reel should start revolving at the same time or a little while after pressure roller (30) starts pulling the tape past the heads.

Check the adjustment by placing a fully-loaded 7-inch reel on the take-up spindle. Rewind for about ten seconds. Move the Play-Record control to the Playback position, and observe the foregoing action.

If adjustment is required, bend the ear on take-up reel arm (65) in the position and direction indicated in the sketch on the Exploded View. Make this adjustment carefully. Repeated trials between bends should be made.

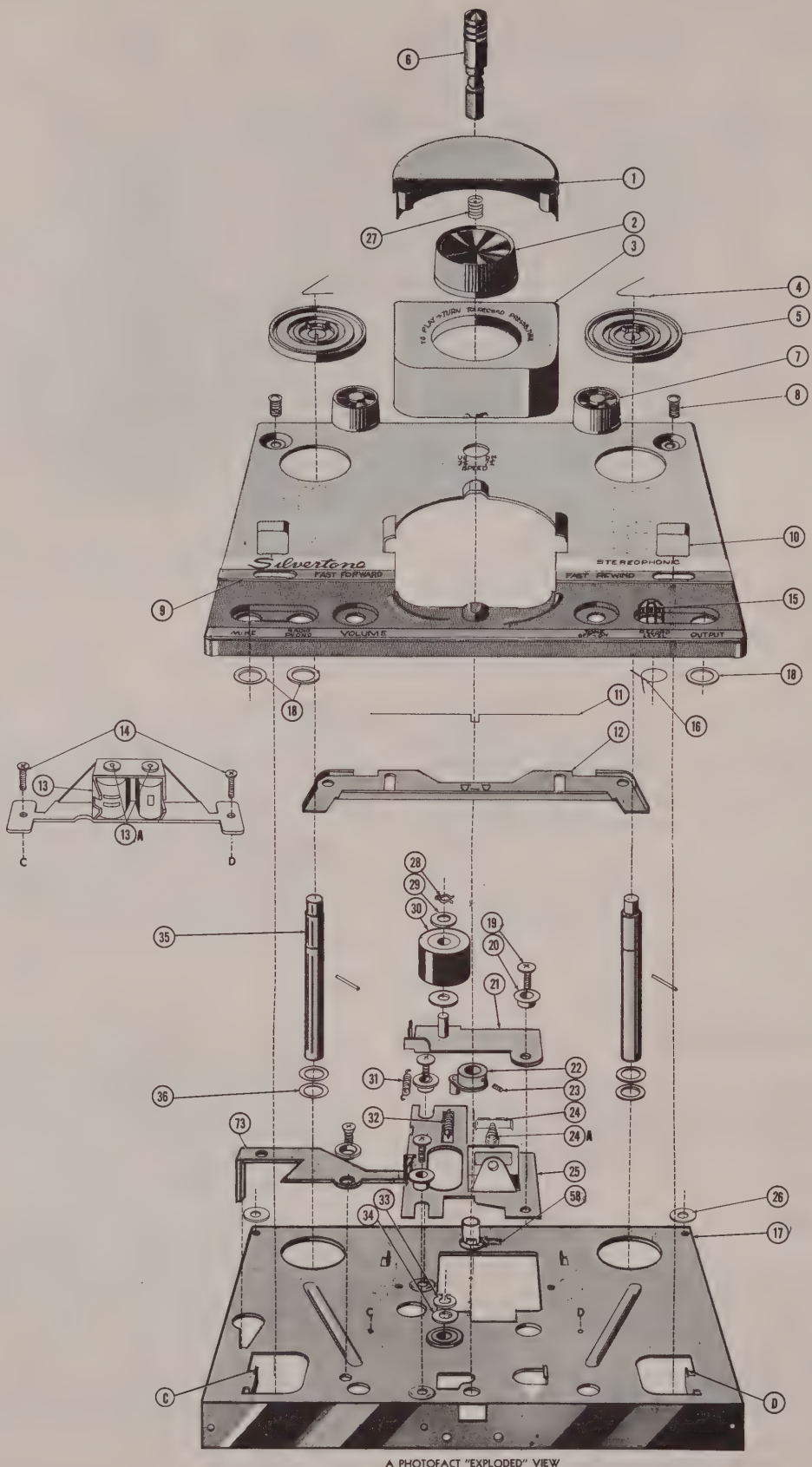


FIG. 3A EXPLODED VIEW OF PARTS ABOVE BASE PLATE.

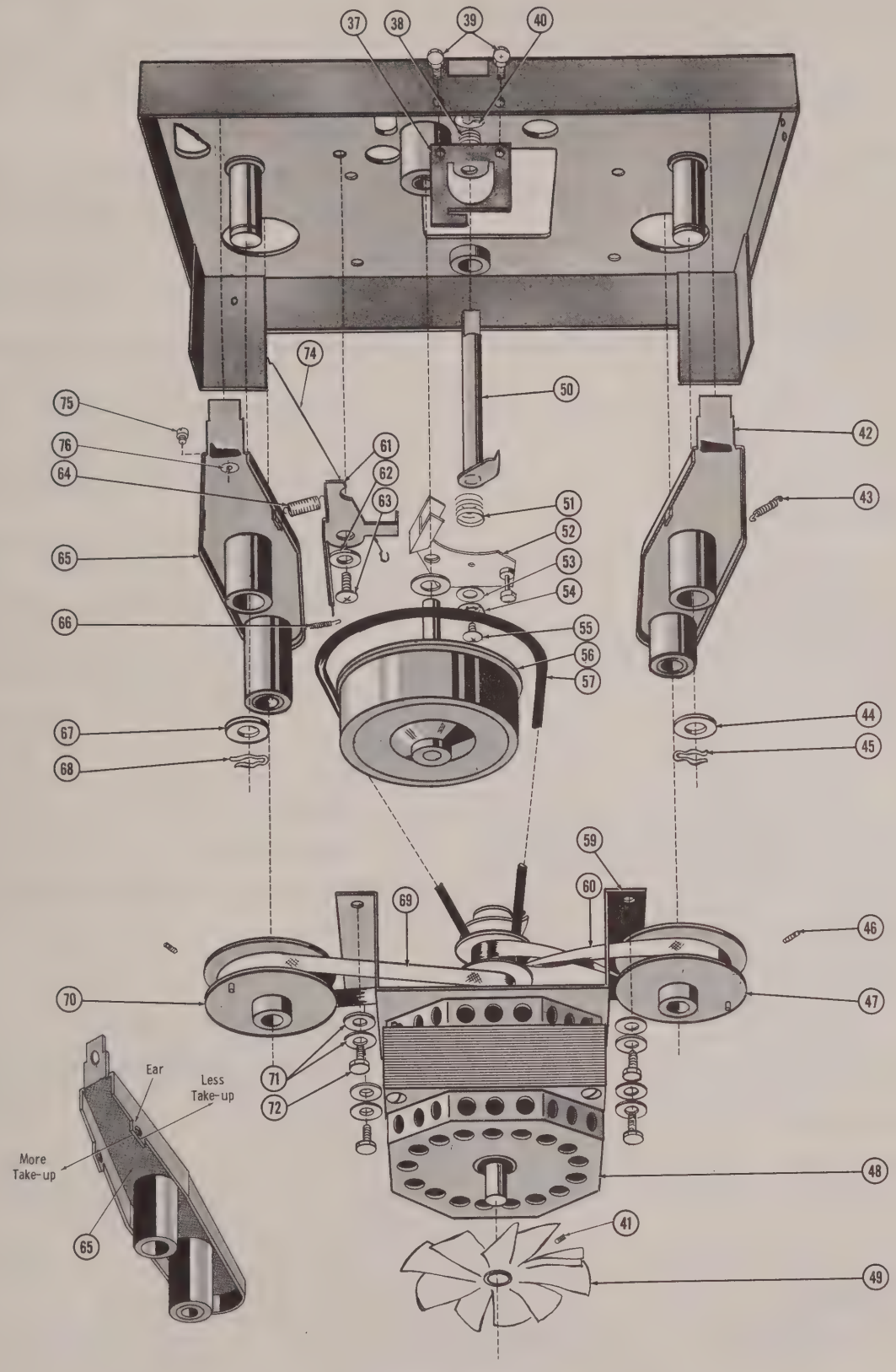


FIG. 3B EXPLODED VIEW OF PARTS BELOW BASE PLATE.

Switch Cam Adjustment

The Play-Record switch on the amplifier chassis is normally held in the Play position by a spring on the switch arm. When the cam on the end of control shaft (50) actuates the switch, it should move far enough to allow all circuits to be switched from Playback to Record. If adjustment is required, proceed as follows:

1. Loosen set screw (23).
2. Carefully detach one end of the switch spring.
3. Push the Play-Record control down and turn it clockwise to the Record position.
4. Manually move control shaft (50) until the first slide contact touches only the first two wiper contacts. Control shaft (50) must touch the switch slide at all times during this step.
5. Move lifter arm (22) to the Record position, and tighten set screw (23).
6. Reconnect the switch spring.

Head Height Adjustment

1. Place a piece of transparent tape across the head and into the tape guide.
2. Observe the position of the pole pieces. If they need adjusting, loosen set screw (13A) and the hex nuts at each head for the correct position across the width of the tape.
3. The pole pieces should extend far enough beyond the edge of the tape to be visible on the half-track portion of the erase head.
4. On the half-track portion of the record-playback head, the pole pieces should be approximately 0.01 inch inward from the edge of the tape.

Head Alignment Adjustment

It is extremely important that head assembly (13) be lined up perfectly with the tape. If not, low output, track overlap, or loss of high frequencies may result.

1. Set the Track Selector switch to the A_1B_1 position.
2. Connect an AC meter or scope across the Output jack or speaker.
3. Thread a constant-tone alignment or commercially recorded tape on the unit.
4. Turn the Play-Record control to the Play position.
5. Loosen set screw (13A) and the hex nuts at the side of the head.
6. Adjust the head for maximum output, as indicated on the meter or scope.
7. Tighten the hex nuts and set screw (13A) after the head is properly aligned.

LUBRICATION

The lubrication applied during manufacture should be sufficient for a long time. Under unusual use or high operating temperatures, or if a part has been replaced, lubrication may be required. With No. 20 Motor Oil:

1. Bushing shafts of take-up reel arm (65) and feed reel arm (42).
2. Bearings for take-up and rewind spindles (35).
3. Bearing for capstan shaft and flywheel (56).
4. Shafts for pressure roller (30).

Grease or Lubricate:

1. Bearing surfaces and right guide surface of pressure plate (25).
2. Lifter arm (22).
3. Surfaces of pressure roller arm (21).

Do Not Lubricate:

1. Motor.
2. Drive surfaces of flywheel (56).
3. Drive belts, (57), (60), and (69). If oil is thrown onto these belts, clean them with a petroleum solvent.

TROUBLE CHART

Symptom	Cause	Remedy
Improper tape take-up.	1. Spindle (35) binding.	1. Lubricate and check end play. See Adjustment under "Spindle End Play."
	2. Drive belts slipping.	2. Clean pulleys with a petroleum solvent.
	3. Broken drive belt (69).	3. Replace drive belt (69).

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	4. Improper take-up spring (64) action.	4. See "Take-up Lever Adjustment."
Improper fast forward of tape.	1. See "Improper Tape Take-up" in Trouble Chart, except omit Step 4.	1. See corresponding remedies.
Motor and amplifiers do not operate	1. Power supply defective.	1. Check voltage per schematic.
	2. Damaged power cord.	2. Repair or replace power cord.
	3. Defective Off-On switch.	3. Replace Off-On switch.
Does not record.	1. Faulty microphone or cord.	1. Replace, if necessary, after checking recorder with another type of input.
	2. Faulty input jack.	2. Replace input jack, if necessary.
	3. Faulty tube.	3. Replace any defective tubes.
	4. Open play-record head.	4. Check continuity. After checking continuity, demagnetize the head.
Wow	1. Drive surfaces slipping.	1. Clean motor pulley, capstan shafts and flywheel (56), and pressure roller (30) with a petroleum solvent. Replace rubber roller if oil-soaked.
	2. Flat spot on pressure roller (30), indicated by a rapid thumping sound while the unit is running.	2. Run the unit for several minutes; if the condition does not clear up, replace pressure roller (30).
	3. Too much feed-reel drag.	3. Check adjustment, as described under "Take-up and Feed-Reel Drag Adjustment."
No erase	1. Faulty bias oscillator tube.	1. Check bias oscillator tube; replace if defective.
	2. Faulty erase head.	2. Replace erase head.
	3. Erase head disconnected.	3. Connect erase head.
No playback. Tape plays back with poor frequency response.	1. Faulty play-record switch.	1. Replace or repair switch.
	2. Accumulation of foreign matter or tape coating oxide on head pole pieces.	2. Clean the head.
Records weakly and with very poor frequency response.	1. Dull-coated side of tape not facing heads.	1. Reverse tape on reels.
No playback.	1. Faulty play-record switch.	1. Replace or repair switch.
	2. Track Selector switch in wrong position.	2. Place Track Selector switch in the proper position.

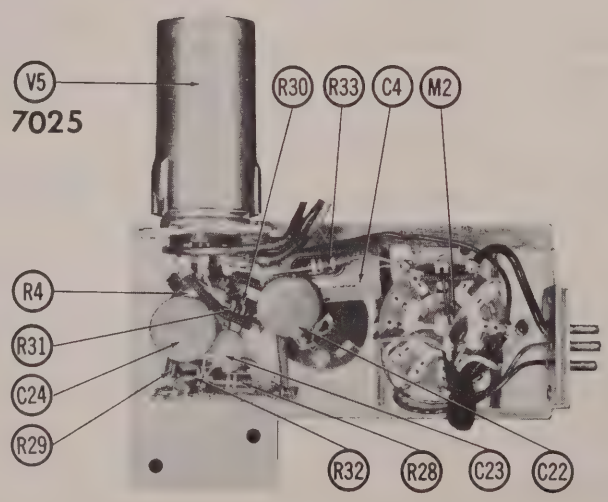
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	21-554-0	Head Cover
2	52-1271-0	Play and Record Knob
3	21-543-0	Pressure-Roller Cover
4	22-110-0	Reel-Plate Retainer (2)

MECHANICAL PARTS LIST (CON'T.)

Ref. No.	Part No.	Description
5	84-7855	Reel-Plate Holder Assembly (2)
6	84-3405	Speed-Selector Knob and Shaft Assembly
7	52-1270-0	Knob, Volume, and Off-On Tone (2)
8	57-604221	#6-32 x 1/4 Phil. Flat Hd. Screw (2)
9	40-203-0	Control Escutcheon
10	52-1269-0	Fast-Forward and Fast-Rewind Knob
11	70-249-0	Brake-Plate Spring
12	29-112-0	Brake Plate
13	84-7866	Head and Bracket Assembly
14	57-604221	#6-32 x 1/4 Phil. Flat Hd. Mach. Screw
15	48-88-2	Neon-Lamp Jewel
16	22-120-0	Retainer Spring
17	84-7867	Motorboard Assembly
18	58-265	3/4 x .379 x .031 Flatwasher, Fiber (3)
19	57-604221	#6-32 x 1/4" Phil. Hd. Mach. Screw (4)
20	72-135	Slide Button (4)
21	84-3408	Pressure-Roller Arm Ass'y.
22	84-3399	Lifter Arm and Set-Screw Ass'y.
23	97-577	#6-32 x 3/8" Cone Pt. Slab Hd. Set Screw
24	84-3401	Pressure Shoe and Pad Assembly
24A	70-253-0	Pressure-Shoe Spring
25	84-3458	Pressure-Plate Assembly
26	58-273	Flatwasher (2)
27	70-259-0	Compression Spring
28	22-40-1	Hairpin Retainer
29	58-282	.328 x .195 x .005 Cloth Flatwasher (2)
30	39-37-5	Pressure Roller
31	70-258-0	Capstan Pressure Spring
32	70-255-0	Pressure-Plate Spring
33	22-37-1	Retainer Ring
34	58-372	Capstan Washer
35	84-3404	Spindle Assembly (2)
36	58-280	Flatwasher
37	11-1046	Shaft Positioning Bracket
38	70-260-0	Record Release Spring

Ref. No.	Part No.	Description
39	57-604291	#6-32 x 1/4" Phil. Pan Hd. Screw (2)
40	22-38-1	Ring Retainer
41	97-619	#8-32 x 3/16 Allen Hd. Cup Pt. Set Screw
42	84-3419	Feed-Reel Arm Assembly
43	70-252-0	Right Brake Spring
44	58-289	Flatwasher
45	22-42-1	Hairpin Retainer
46	97-577	#6-32 x 3/8 Cone Pt. Slab Hd. Set Screw
47	84-6726	Spindle Pulley and Set-Screw Assembly
48	59-119	Motor
49	84-4240	Fan and Hub Assembly
50	84-3410	Control Shaft and Lever Ass'y.
51	70-259-0	Compression Spring
52	22-123-4	Belt, Transfer Lever
53	58-284	Flatwasher
54	58-173	#6 Int. Tooth Lockwasher
55	57-604291	#6-32 x 1/4" Phil. Pan Hd. Screw
56	84-7688	Capstan Shaft and Flywheel Ass'y.
57	62-79-0	Drive Belt (Flywheel)
58	70-256-0	Detent Plunger Spring
59	84-3407	Bracket and Lug Assembly
60	39-40-5	Drive Belt
61	22-13-4	Take-up Lever
62	72-135	Slide Button
63	57-604221	#6-32 x 1/4" Phil. Flat Hd. Screw
64	70-250-0	Take-up Spring
65	84-3420	Take-up Reel-Arm Ass'y.
66	70-257-0	Left Brake Spring
67	58-289	Flatwasher
68	22-42-1	Hairpin Retainer
69	39-40-5	Drive Belt
70	84-6726	Spindle Pulley and Set-Screw Assembly
71	58-294	Flatwasher
72	57-803271	#8 x 32 x 3/16" Hex. Hd. Screw
73	22-15-4	Foot-Switch Lever
74	39-5-3	Foot-Switch Linkage Rod
75	39-1-0	Foot-Switch Adjustment Cam
76	22-46-1	"C" Washer



PREAMPLIFIER CHASSIS.

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Preamplifier	7025
V2	AF Amplifier	12AX7
V3	Output-Bias Osc.	6V6GT
V4	Rectifier	6X5GT
V5	Stereo. Preamplifier	7025

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300	18-31-3	AFH3-44	C0350	FP327.89	TMT-23	TVL-3787	
B	■40	300							
C	▲40	300							
C2	25	25	18-52-5	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	
C3	4	50	18-25-0 ①	PRS1400	BBR4-50	TC30	TD-4-50	TVA-1402	
C4	25	25	18-52-5	PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	

① Some versions may use 5mfd@100V (paper) in this application (Part #20-21-1).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

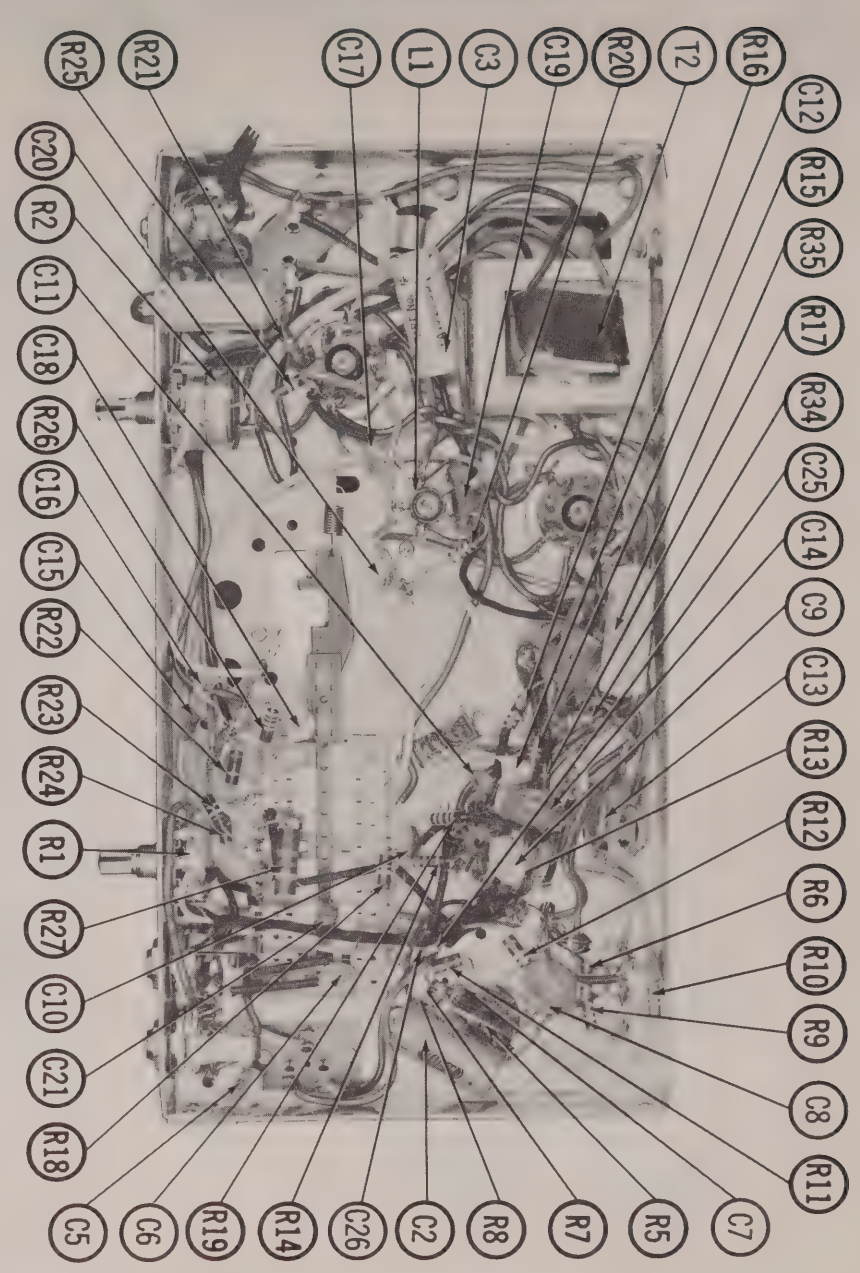
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	1500	Note 1	BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C6	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C7	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C11	560		DI-560	DD-561	L10T56	CCD-561	GP356	10TS-T56
C12	750 10%		DI-750	DD-751	1R5T75	CCD-751	GP375	10TS-T75
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C14	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C15	75 10%		NPO-DI 75	DD-750	L10Q75	CCD-750	GP475	10TS-Q75
C16	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C17	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C18	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C19	1000 5%	*(3000mmf)	1469-001		1R5D1	CM-20B-102J	MCJ255	MS-21
C20	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C21	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C22	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C23	1000 10%		DI-001	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C24	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C25	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C26	10 N750 10%		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10

* Alternate Value.
① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	24-267-0	B-60	A47-500K-Z	Q13-133	U-48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	24-143-2	B-60-S	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On
R3	200Ω	1WW	24-1-3				FL200P	Hum Adjust
R4	200Ω	1WW	24-1-3				FL200P	Hum Adjust Preamp.

AMP CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	1meg	
R6	220K	
R7	4700Ω	
R8	470K	
R9	100K	(120K) *
R10	220K	
R11	4700Ω	
R12	100K	
R13	220K	
R14	1500Ω	
R15	220K	

ITEM No.	RATING	REMARKS
R16	100K	
R17	2200Ω	
R18	150K	
R19	68K	
R20	47K	
R21	2.2meg	
R22	1meg	Note 1
R23	560K	
R24	5.6meg	
R25	10K	
R26	470K	

ITEM No.	RATING	REMARKS
R27	270Ω 1W	
R28	220K	
R29	390K	
R30	4700Ω	
R31	470K	
R32	220K	
R33	4700Ω	
R34	15K	
R35	1000Ω 5W	

* Alternate Value.
Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Bias Osc.	10-59-4						

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .32A	580 VCT @ .040A	6.3V @ .3A	80-38-0						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.7A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4600Ω	6-8Ω	80-59-1	24S64①	A-2901①	AU-604①	A-3850 ①	24S64①	S-53X①	① Drill New Mounting Hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	33-265-4	5A1	
SP2	5"	PM	3-4Ω	33-265-4	5A1	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Head Assembly	84-7866	Include Play-Record Head, Erase Head And Bracket
M2	Switch	69-305-0	Selector (Preamp)
M3	Switch	69-238-0	Function (Slide Type)
M4	Switch	69-312-0	Equalizer
M5	Motor	59-119	
	Microphone	33-39-1	

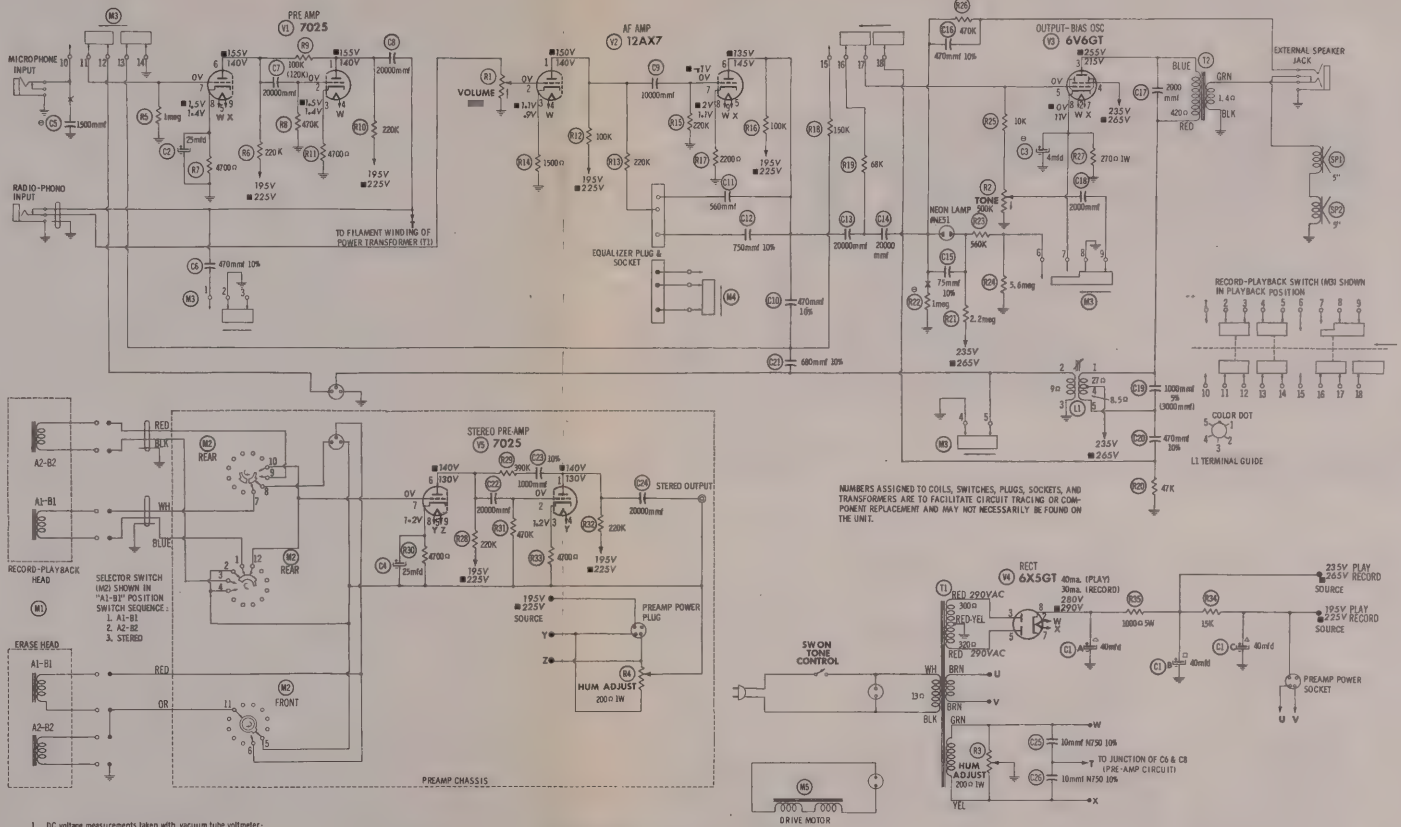
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1270-0	Off-On-Volume, Tone
Knob	52-1271-0	Play & Record
Knob	52-1269-0	Fast Forward & Rewind
Knob	52-1272-0	Track Selector
Cabinet	42-34-5	
Handle	49-541	Include Mounting Hardware

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)


PRE AMP V1 7025
AF AMP V2 12AX7
OUTPUT-BIAS OSC V3 6V6GT
STEREO PREAMP V5 7025
RECT V4 6X5GT 40ma. (PLAY) 30ma. (RECORD)
MICROPHONE INPUT
RADIO-PHONO INPUT
VOLUME
TONE
EQUALIZER PLUG & SOCKET
NEON LAMP #NE51
EXTERNAL SPEAKER JACK
TO FILAMENT WINDING OF POWER TRANSFORMER (T1)
RECORD-PLAYBACK SWITCH (M3) SHOWN IN PLAYBACK POSITION
COLOR DOT
L1 TERMINAL GUIDE
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
RECORD-PLAYBACK HEAD
SELECTOR SWITCH (M2) SHOWN IN "A1-B1" POSITION
SWITCH SEQUENCE:
1. A1-B1
2. A2-B2
3. STEREO
ERASE HEAD
STEREO OUTPUT
PREAMP POWER PLUG
HUM ADJUST 200Ω 1W
PREAMP CHASSIS
SOURCE
SW ON TONE CONTROL
PREAMP POWER SOCKET
TO JUNCTION OF C6 & C8 (PRE-AMP CIRCUIT)
DRIVE MOTOR
235V PLAY 265V RECORD SOURCE
195V PLAY 225V RECORD SOURCE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.

II. All controls at minimum, proper output load connected.

⊛ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7025	↑160K	470K	4700Ω	50Ω	50Ω	↑160K	1meg	4700Ω	50Ω
V2	12AX7	↑115K	0Ω	1500Ω	50Ω	50Ω	↑115K	220K	2200Ω	50Ω
V3	6V6GT	NC	50Ω	↑1500Ω	↑1000Ω	510K	TP	50Ω	270Ω ⊛0Ω	
V4	6X5GT	TP	50Ω	300Ω	NC	320Ω	NC	50Ω	¶	
V5	7025	↑235K	470K	4700Ω	50Ω	50Ω	↑235K	0Ω	4700Ω	50Ω

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
⊛ MEASURED IN "RECORD" POSITION.
↑ MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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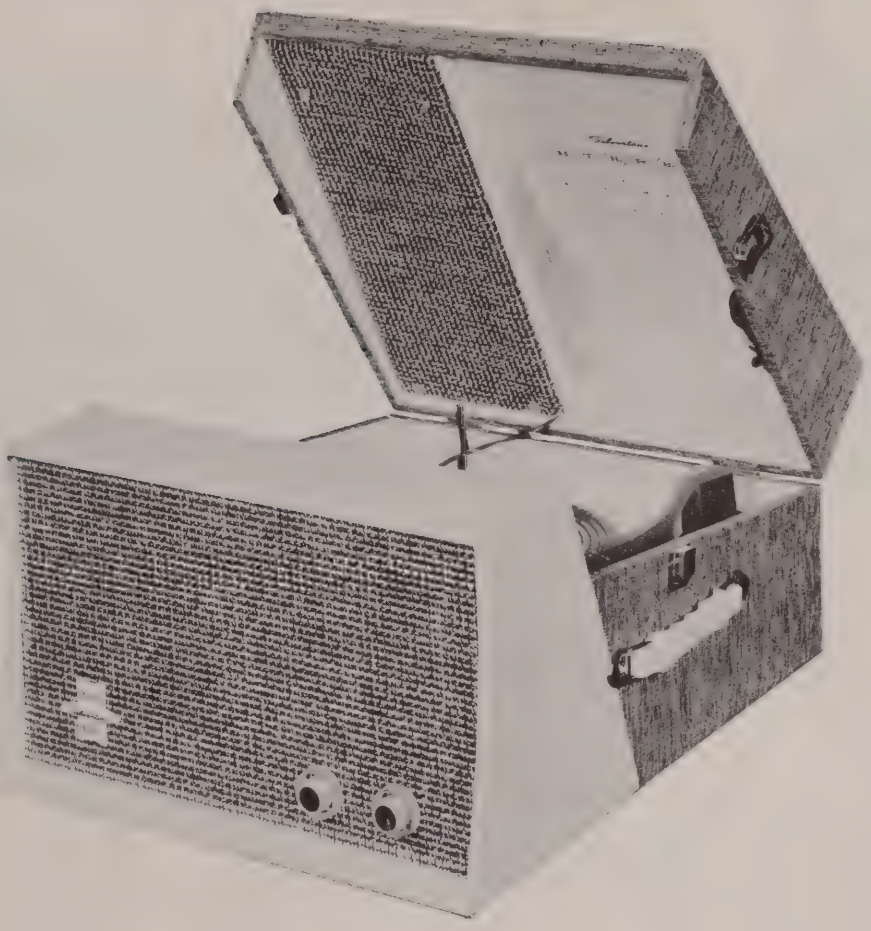
SILVERTONE MODEL 232
(Ch. 528.58120, 528.59490, 528.59500)

PHOTOFACT® Folder

SILVERTONE MODEL 262
(Ch. 528.59320, 528.59321)

SILVERTONE MODEL 262
(Ch. 528.59320, 528.59321)



SILVERTONE MODEL 262
(Ch. 528.59320, 528.59321)

TRADE NAME	Silvertone Model 262 (Ch. 528.59320, 528.59321)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Stereo Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 34 Watts, .38 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER 528.56682 or 528.56683 — SEE SIMILAR SILVERTONE 528.56100 — PHOTOFACT SET 417 FOLDER 10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT551

SET 471 FOLDER 17

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V2 V3	Left Channel Output Right Channel Output	50C5 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A B	▲150 ▲50	150 150	18-48-3	AFH3-26	B0608	FP117.5 TC495	TMD-20	TVL-2443.5	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C5	5000	Note 1	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C9	5000	Note 1	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S2
C11	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C12	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

Note 1. Chassis 528.59321 uses 10000mmf@1000V in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2meg		24-345-0					Volume, Left Channel
B	2meg							Volume, Right Channel
R2A	500K		24-195-2	AB-613	AD47-500K-S			Tone, Left Channel
B	500K			SR-613	Not Req.			Tone, Right Channel
C	Shaft			AK-8	RS-3/16			

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

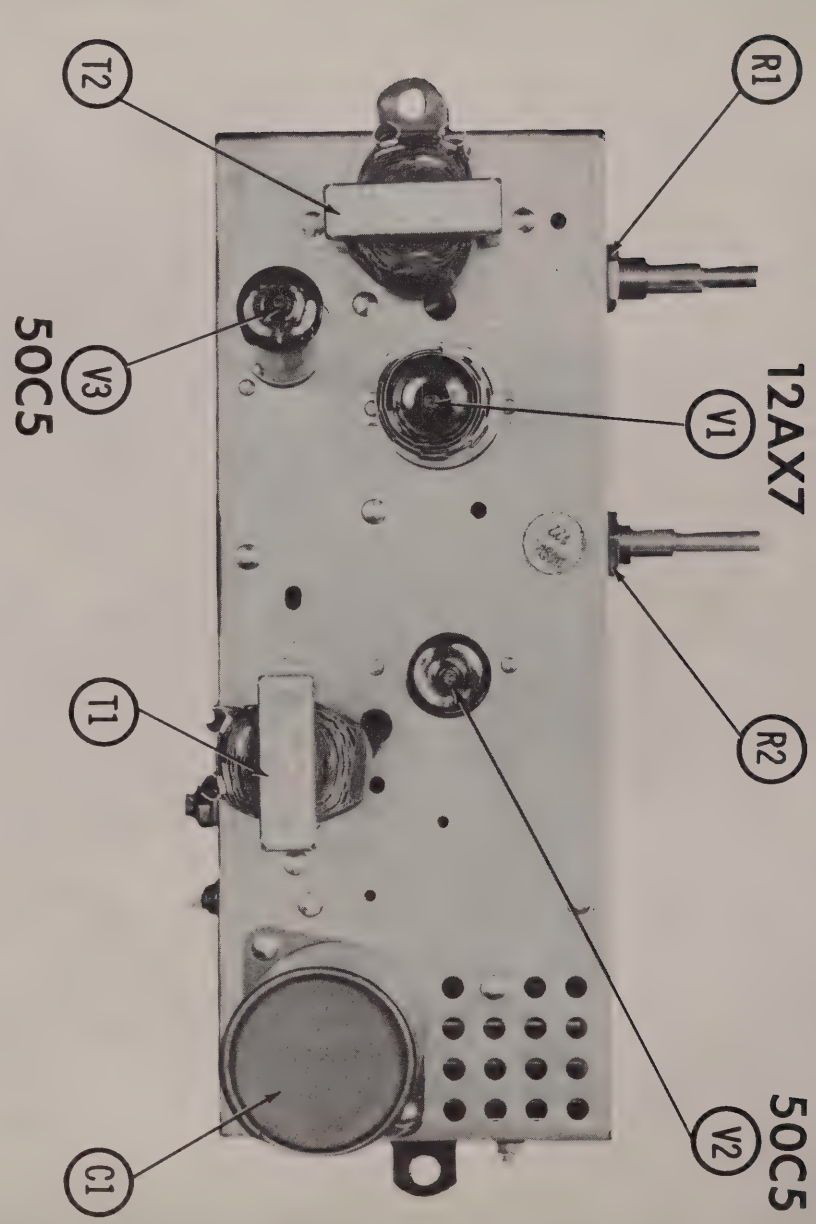
ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R3	2.2meg		R7	2.2meg		R11	82Ω 2W	#60-82021
R4	270K		R8	270K		R12	27Ω 2W	#61-145-0
R5	68K		R9	68K		R13	2700Ω 1W	
R6	120Ω		R10	120Ω				

Silvertone Part Number

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	6-8Ω	80-97-1	22S86 ①	A-2902①	AU-604①	A-3849 ①	22S86 ①		① Drill new mounting hole.
T2	2600Ω	6-8Ω	80-97-1	22S86 ①	A-2902①	AU-604①	A-3849①	22S86①		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	5 1/4"	PM	6-8Ω	33-405-4	5A1Z7.1	
SP2	5 1/4"	PM	6-8Ω	33-405-4	5A1Z7.1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.054A	86-15-3 ①	RS150 ①	1235AH ①	150 ①	SR-200 ②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	33-319-0	13TB *	Not Req.	66 ǂ	Not Req.			8TA4-S *	N-8TA-S

* Includes mounting bracket.
ǂ Use mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	33-319-0 ①			① Includes cartridge

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Switch Ass'y.	84-7838	On-Off (Part of Changer)
M5	Motor	59-72	Complete (Part of Changer Chassis 528, 56682)
	Motor	59-89	Complete (Part of Changer Chassis 528, 56683)
	45 RPM Adaptor	84-7493	

CABINETS & CABINET PARTS

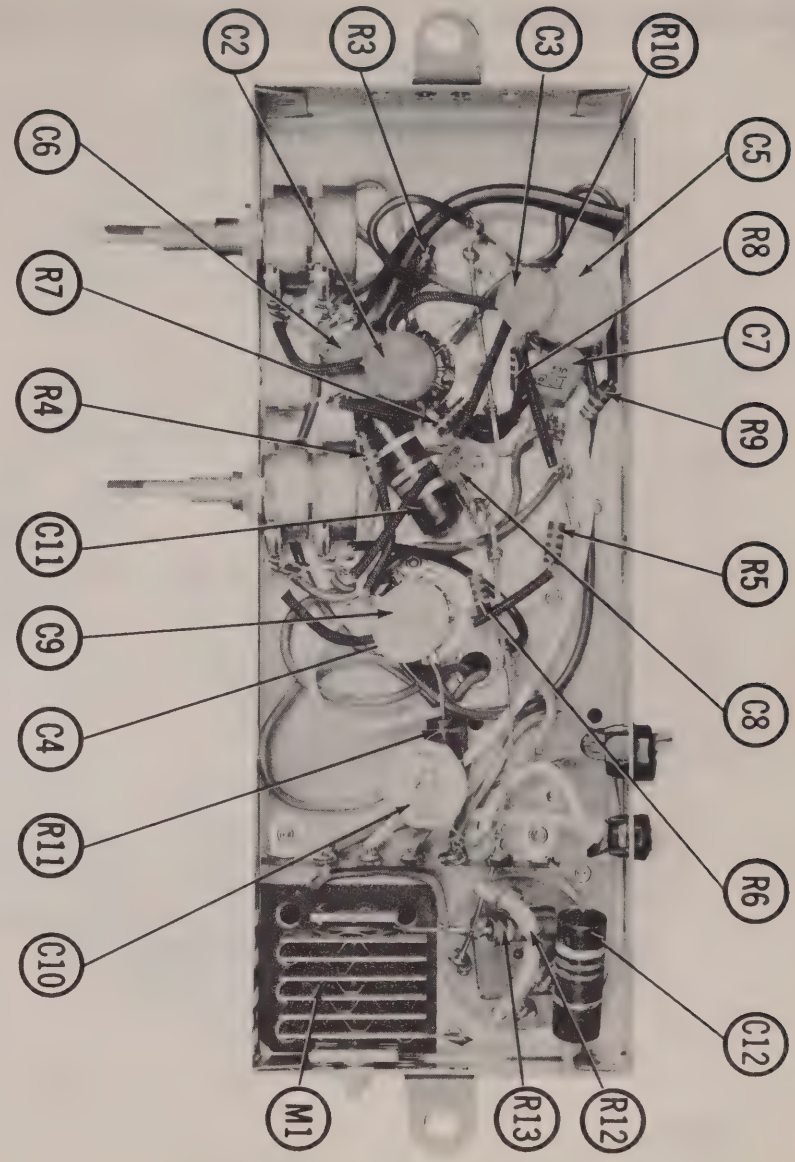
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

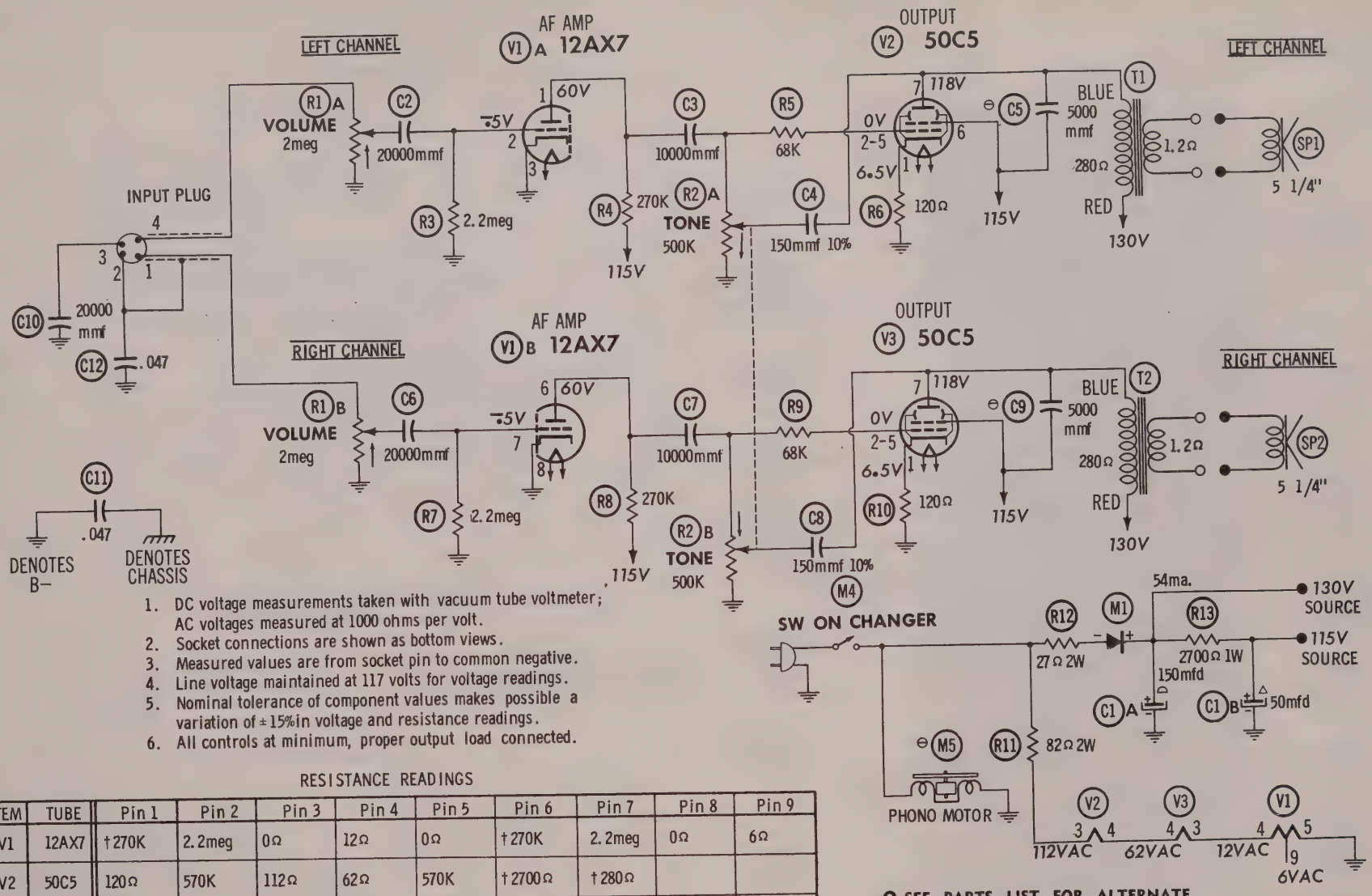
NAME	PART NO.	DESCRIPTION
Knob	52-1266-0	Loudness
Knob	52-1258-0	Tone
Knob	52-1244-0	Balance
Knob	52-882-0	Size Selector (On Changer)
Knob	52-1120-0	Off-On-Reject (On Changer)
Knob	52-918-0	Speed Control (On Changer)
Cabinet	42-96-2	
Handle	49-469	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†270K	2.2meg	0Ω	12Ω	0Ω	†270K	2.2meg	0Ω	6Ω
V2	50C5	120Ω	570K	112Ω	62Ω	570K	†2700Ω	†280Ω		
V3	50C5	120Ω	570K	12Ω	62Ω	570K	†2700Ω	†280Ω		

† MEASURED FROM OUTPUT OF M1.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODEL 262
(Ch. 528.59320, 528.59321)

PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

STEELMAN
MODEL 2-6231

STEELMAN
MODEL 2-6231

STEELMAN
MODEL 2-6231

TRADE NAME	Steelman Model 2-6231
MANUFACTURER	Steelman Phono & Radio Co., Inc., Mount Vernon, N. Y.
TYPE SET	AC Operated 4 Tube Phono Amplifier With 4 Speed Automatic Stereo Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 62 Watts, .69 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR V-M 1200A — PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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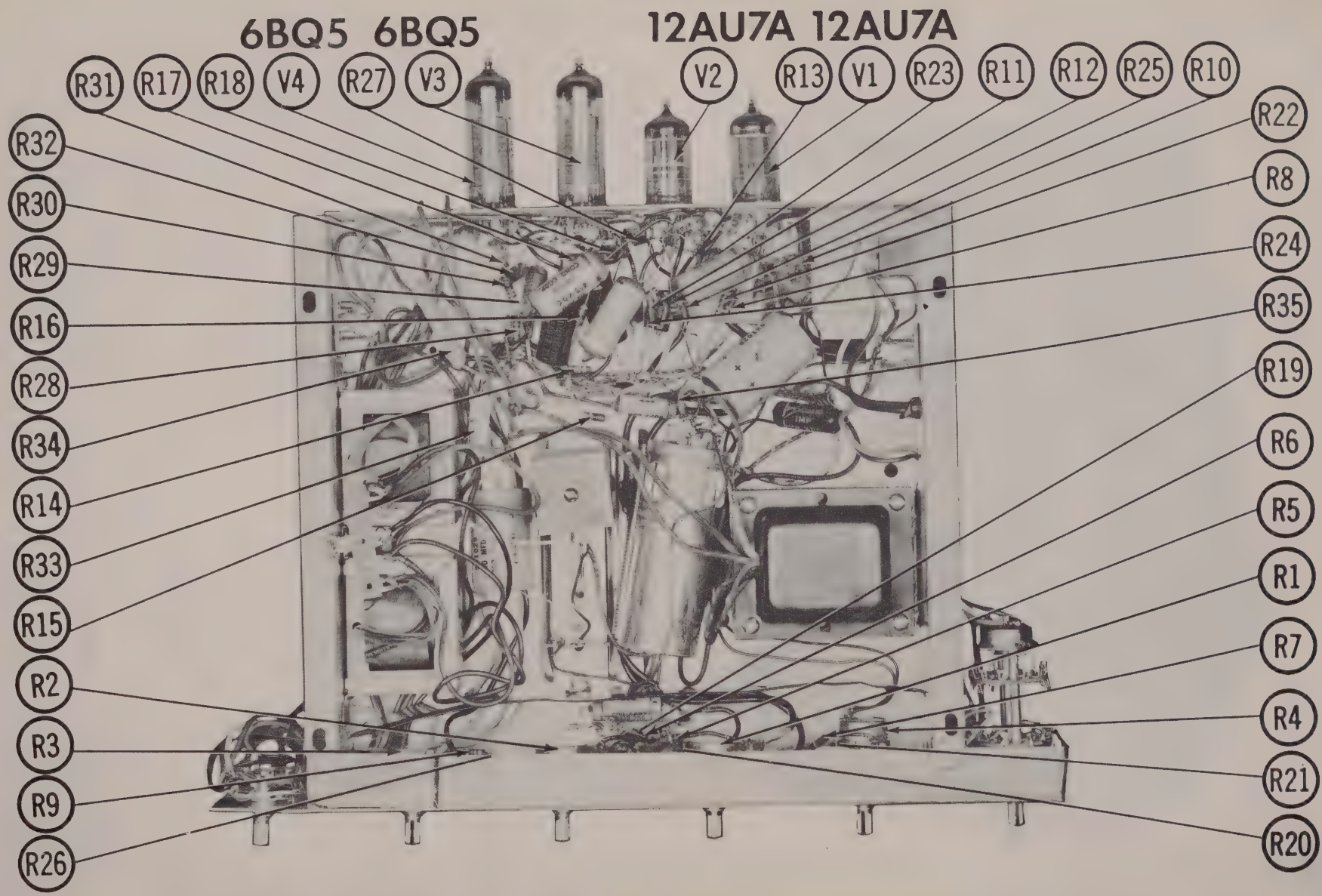
JT592

SET 471 FOLDER 18



CHASSIS TOP VIEW – TUBE & RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A
V3	Left Channel Output	6BQ5/ EL84
V4	Right Channel Output	6BQ5/ EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	40	250	581029	PRS1580	BR4025	TC58	TD-40-250	TVA-1511	
C2A	▲40	250	583027	AFH3-44	C0350	FP377	TMT-40	TVL-3787	
B	▲40	400							
C	■40	400							
C3	40	250	581029	PRS1580	BR4025	TC58	TD-40-250	TVA-1511	
C4	10	25	581023	XPP-25010	NLW10-25	TT50X10	ML10-25	TE-1204	
C5	10	25	581023	XPP-25010	NLW10-25	TT50X10	ML10-25	TE-1204	
C6	10	25	581023	XPP-25010	NLW10-25	TT50X10	ML10-25	TE-1204	
C7	10	25	581023	XPP-25010	NLW10-25	TT50X10	ML10-25	TE-1204	
C8	100	25	581027	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	
C9	100	25	581027	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

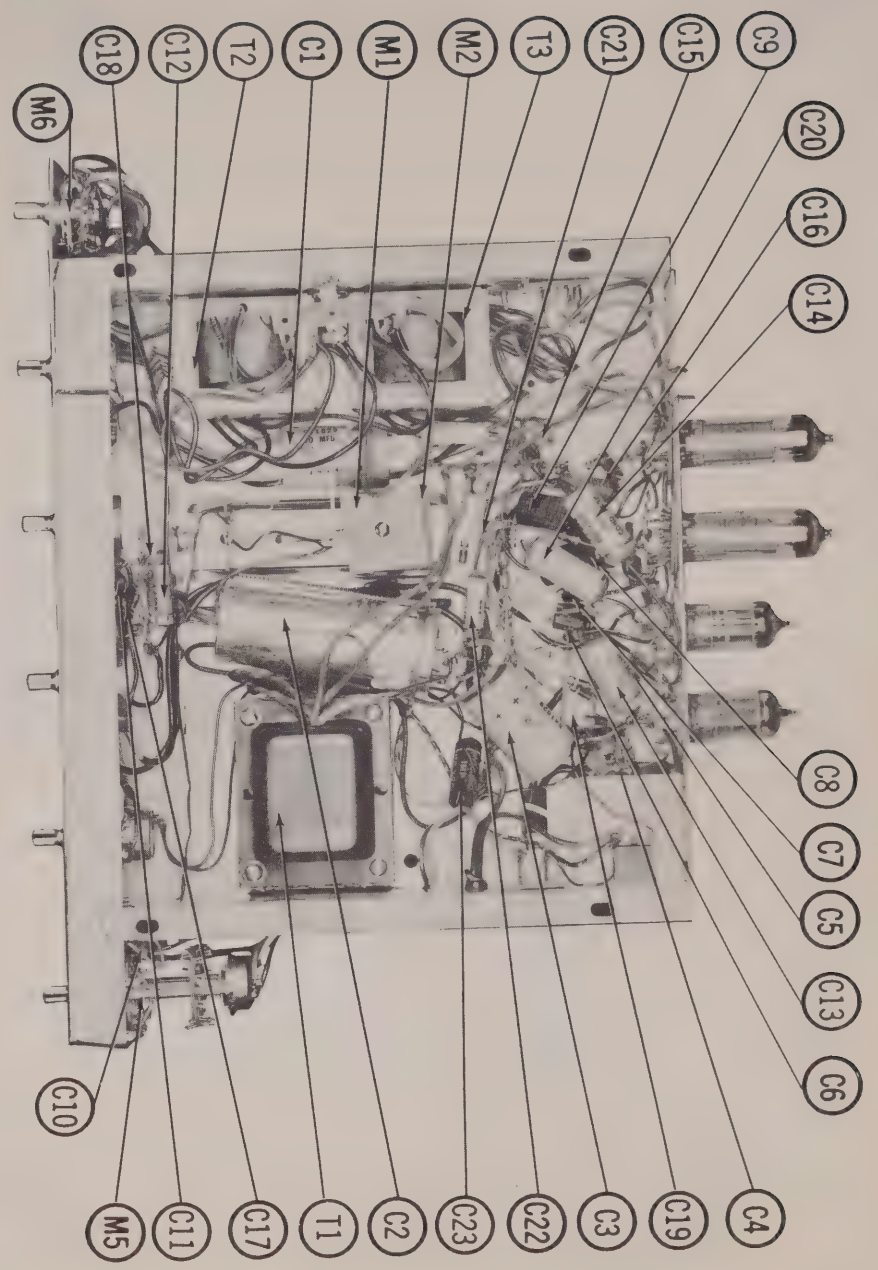
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	5000		SI 5000	D6-502	BYA10D5	CCD-502	UC-525	5HK-D50
C11	680		SI 680	D6-681	BYA10T68	CCD-681	UC-5368	5GA-T68
C12	.0027 600V		P688N-003	D6-272	CUB6D3	6DP-1-272	GEM-623	6TM-D3
C13	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C14	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C15	470		SI 470	D6-471	BYA10T47	CCD-471	UC-5347	5GA-T47
C16	.0027 600V		P688N-003	D6-272	CUB6D3	6DP-1-272	GEM-623	6TM-D3
C17	680		SI 680	D6-681	BYA10T68	CCD-681	UC-5368	5GA-T68
C18	.0027 600V		P688N-003	D6-272	CUB6D3	6DP-1-272	GEM-623	6TM-D3
C19	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C20	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C21	470		SI 470	D6-471	BYA10T47	CCD-471	UC-5347	5GA-T47
C22	.0027 600V		P688N-003	D6-272	CUB6D3	6DP-1-272	GEM-623	6TM-D3
C23	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25meg*		368037				† UE3956	Loudness, Right Channel
B	3.25meg*							Loudness, Left Channel
R2A	250K		368035	B-50	AD47-250K-S	Q11-130	■ UE4062	Treble, Right Channel
B	250K			SR-50	Not Req.	M11-130		Treble, Left Channel
C	Shaft			Not Req.	KSS-3	Not Req.		
R3A	250K		368035	B-50	AD47-250K-S	Q11-130	■ UE4062	Balance, Right Channel
B	250K			SR-50	Not Req.	M11-130		Balance, Left Channel
C	Shaft			Not Req.	KSS-3	Not Req.		
R4A	5meg		368038	B-88	AD47-5meg-S		▲ UE4063S	Bass, Right Channel
B	5meg			SR-88	Not Req.			Bass, Left Channel
C	Shaft			Not Req.	KSS-3			
D	Switch			KR-1	SWE-12			Power Off-On

* Taps @ 1meg and 2meg.
■ "STA-LOC" equivalent: FA254L, RU254L, CS3500.
▲ "STA-LOC" equivalent: FA56A, RU56A, CS3500.
† "STA-LOC" Equivalent: FA36T95, RU36T16, CS3500.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	220K	
R6	100K 5%	
R7	100K 5%	
R8	100K 5%	
R9	47K	
R10	2200Ω	
R11	1meg	
R12	100K 5%	
R13	2200Ω	
R14	180K	
R15	100K 5%	

ITEM No.	RATING	REMARKS
R16	100Ω	
R17	1meg	
R18	150Ω 1W	
R19	100K 5%	
R20	220K	
R21	100K 5%	
R22	100K 5%	
R23	2200Ω	
R24	1meg	
R25	100K 5%	

ITEM No.	RATING	REMARKS
R26	47K	
R27	2200Ω	
R28	180K	
R29	100K 5%	
R30	100Ω	
R31	1meg	
R32	150Ω 1W	
R33	125Ω 5W	#510005
R34	2000Ω 2W	
R35	100K 5%	

Steelman Part Number.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .69A	130V ⓐ .400A (AC)	6.3 VCT ⓐ 2.5A	440021						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6500Ω	8Ω CT	430564							
T3	6500Ω	8Ω CT	430564							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	409005①	12A6A ①	① Parallel & Phase
SP2	4"	PM	4-6Ω	404009 ①	4A1TZ4.7①	② May be used in some early versions.
SP3	12"	PM	3-4Ω	409005 ①	12A6A ①	
SP4	4"	PM	4-6Ω	404009 ①	4A1TZ4.7①	
	8"	PM		408005②		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	STEELMAN PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.110A	380013 ①	RS150 ①	1235AH ①	150 ①	SR-200 ②	① Selenium Type
M2	.110A	380013 ①	RS150 ①	1235AH ①	150 ①	SR-200 ②	② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M3	R-0V-1	80TS †	Not Req.	66 *	Not Req.			† 8TA4-S	N-8TA-S

† Includes Mounting
* Mount PT-3

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

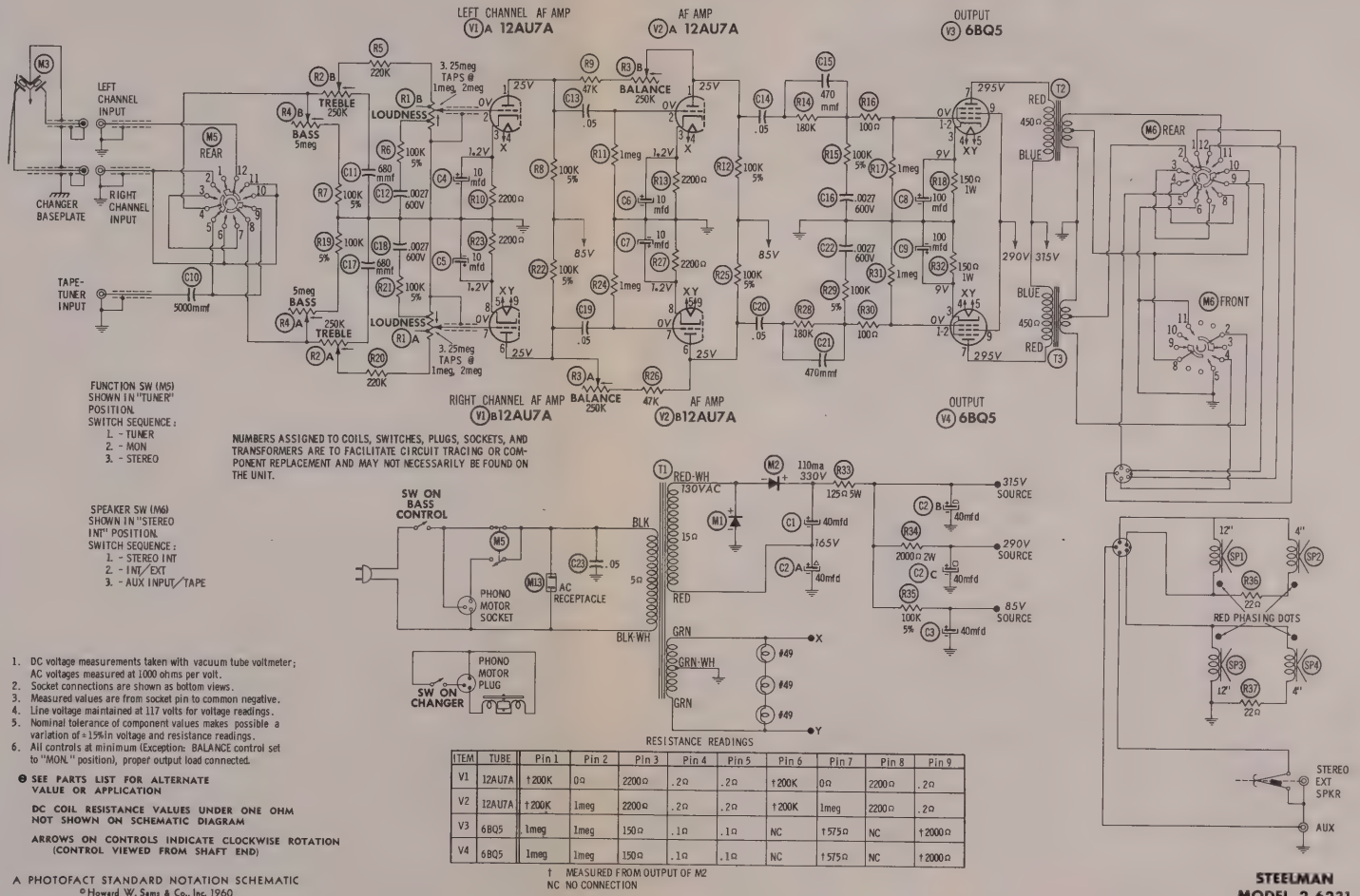
ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M4	329417 †	W-104MGS †	CRA-57X † or CRA-57XD ♦	† Jewel ♦ Diamond
	329419 †	W-104STD †	CRA-57 † or CRA-57D ♦	

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M5	Switch	370052	Function Selector
M6	Switch	370051	Speaker

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum (Exception: BALANCE control set to "MON." position), proper output load connected.

❷ **SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION**

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7A	†200K	0Ω	2200Ω	.2Ω	.2Ω	†200K	0Ω	2200Ω	.2Ω
V2	12AU7A	†200K	1meg	2200Ω	.2Ω	.2Ω	†200K	1meg	2200Ω	.2Ω
V3	6BQ5	1meg	1meg	150Ω	.1Ω	.1Ω	NC	†575Ω	NC	†2000Ω
V4	6BQ5	1meg	1meg	150Ω	.1Ω	.1Ω	NC	†575Ω	NC	†2000Ω

† MEASURED FROM OUTPUT OF M2
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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STEELMAN MODEL 2-6231

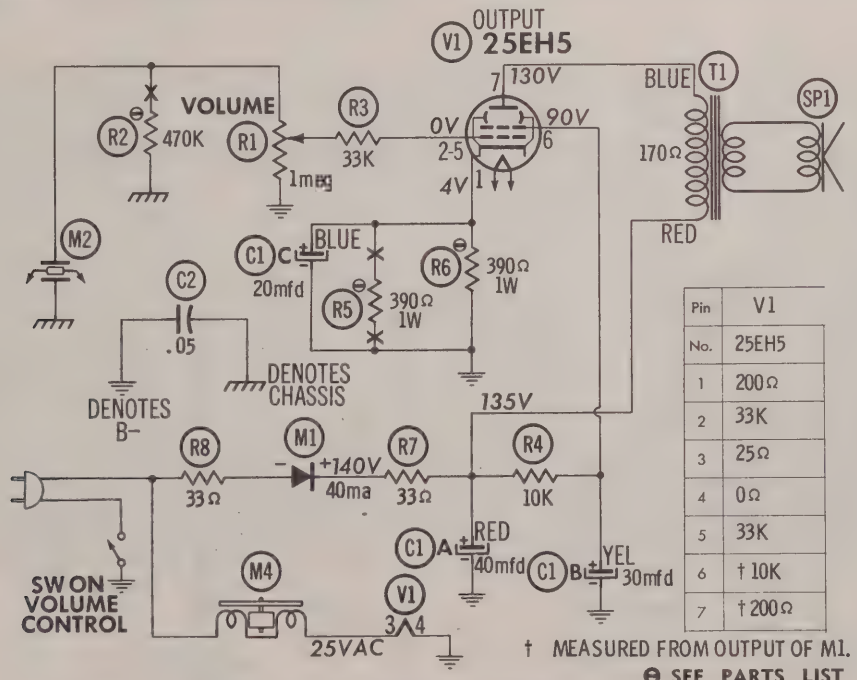
PHOTOFACT® Folder

TRAV-LER MODEL 7078

TRAV-LER
MODEL 7078

TRADE NAME	Trav-Ler Model 7078
MANUFACTURER	Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago 6, Illinois
TYPE SET	AC Operated One Tube Phono Amplifier With 3 Speed Manual Record Player
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 37 Watts, .35 Amp. @117 Volts AC (Less Motor)

TRAV-LER
MODEL 7078



Pin	V1
No.	25EH5
1	200Ω
2	33K
3	25Ω
4	0Ω
5	33K
6	† 10K
7	† 200Ω

† MEASURED FROM OUTPUT OF M1.
⊖ SEE PARTS LIST

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JR495

SET 471 FOLDER 19

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	25EH5			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	150	EC-71	PRS3625	BBRT43215	TCT3105	TDLT-3	TVA-3438	
B	30	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	VC-70	B-70	A47-1meg-Z	Q13-137	U53	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power-Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	470K	Note 1
R3	33K	
R4	10K	

ITEM No.	RATING	REMARKS
R5	390Ω 1W	Note 2
R6	390Ω 1W	Note 2
R7	33Ω	

ITEM No.	RATING	REMARKS
R8	33Ω	

Note 1. Not used in some versions.
Note 2. Some versions may use a single 150Ω to replace R5 & R6.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2450Ω	3-4Ω	(Part of SP1)	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

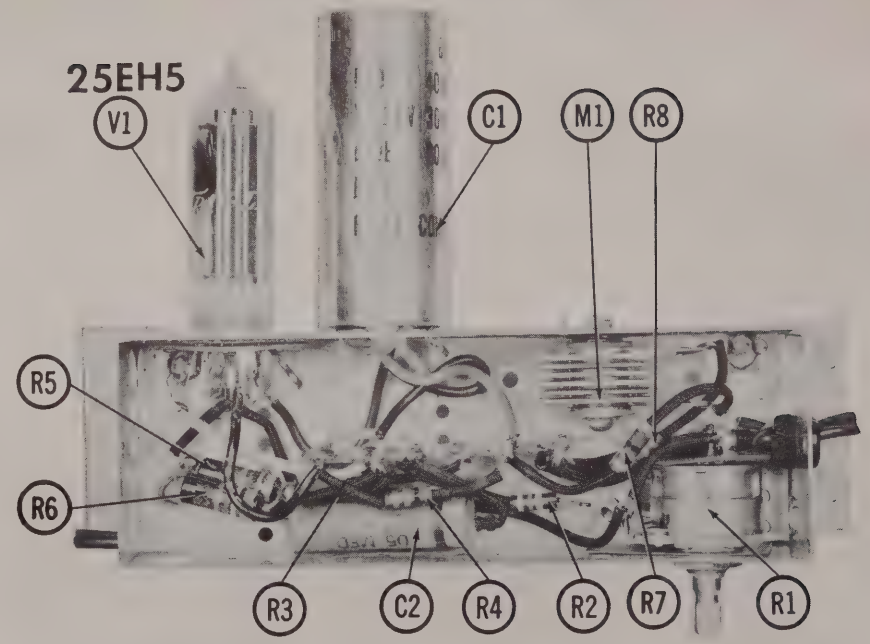
ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SPK-22C①	4A07	

① Includes T1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	TRAV-LER PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.043A	SR-3 ①	RS075①	1234AH ①	65 ①	SR200 ②	① Selenium Type ② Silicon Type

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	TRAV-LER PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	PU-25	420-TS-TB	N8-1			49	VA-29 or VA-29LP		
			N8-3						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	TRAV-LER PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)	W-64S † or W-64D ♦	VA-29 * or VA-29D ♦	† Jewel ♦ Diamond * Metal
	(LP)	W-64MGS † or W-64MGD ♦	VA-29LP † or VA-29LPD	

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M4	Motor	3-M-12	

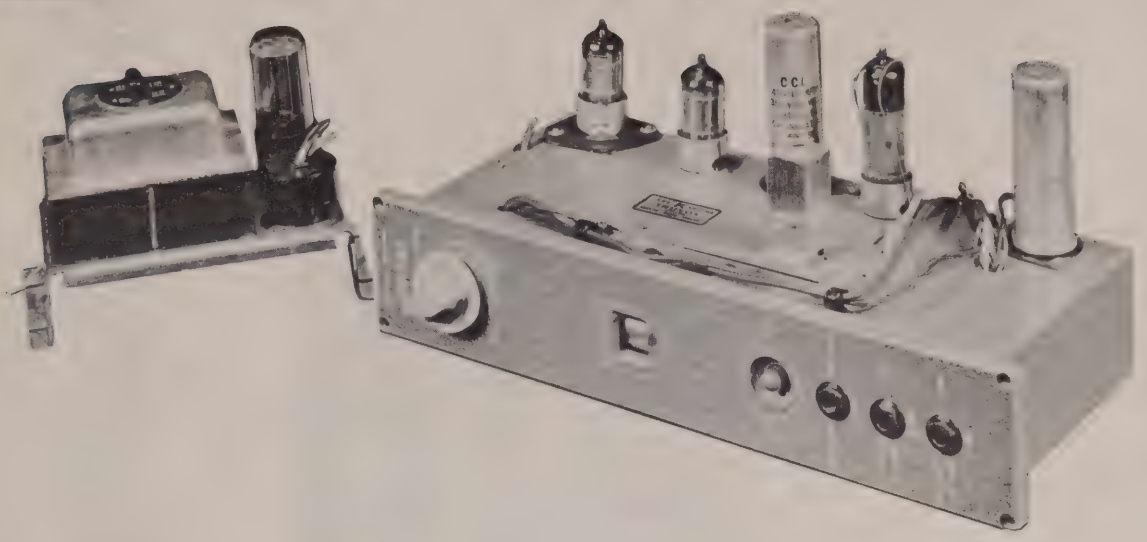
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

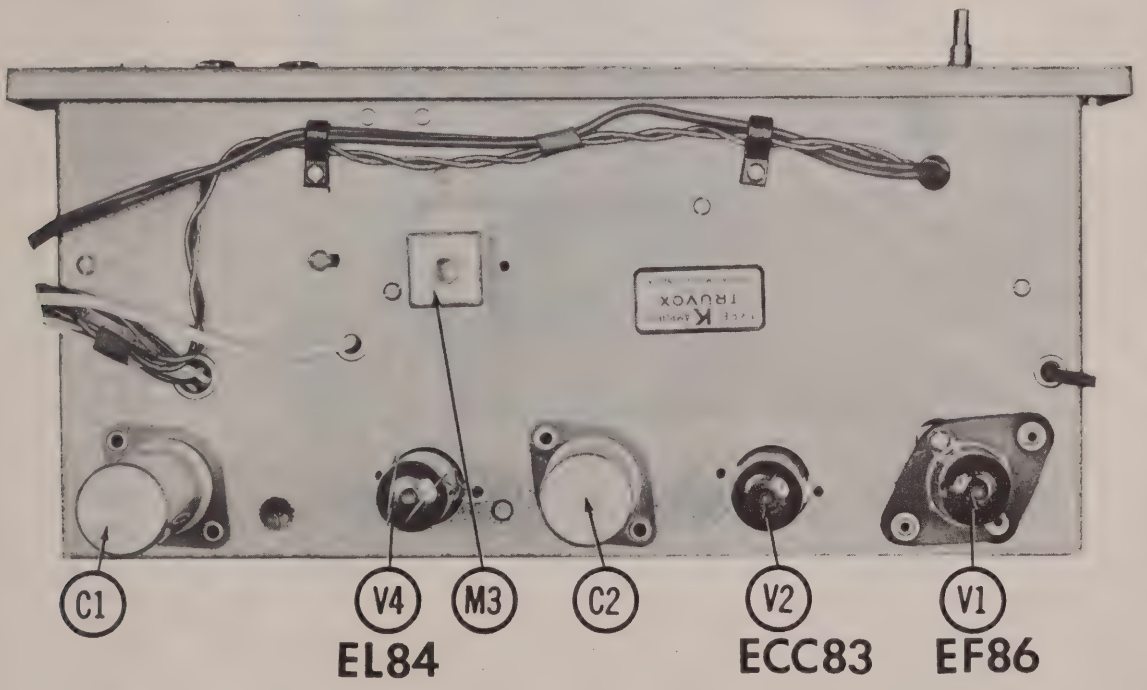
PHOTOFACT* Folder

TRUVOX MODEL TA-42 Type K

TRUVOX MODEL
TA-42 Type K



TRADE NAME	Truvox Model TA-42 Type K
SUPPLIER	Truvox U. S. A., 275 Seventh Ave., New York 1, N. Y.
MANUFACTURER	Truvox Ltd., Measden Lane, London N. W. 10, England
TYPE SET	AC Operated 5 Tube Tape Recorder Amplifier
POWER SUPPLY	117/210/230/250 Volts AC, 60 Cycles RATING 42 Watts, .43 Amp. @ 117 Volts AC (Play)



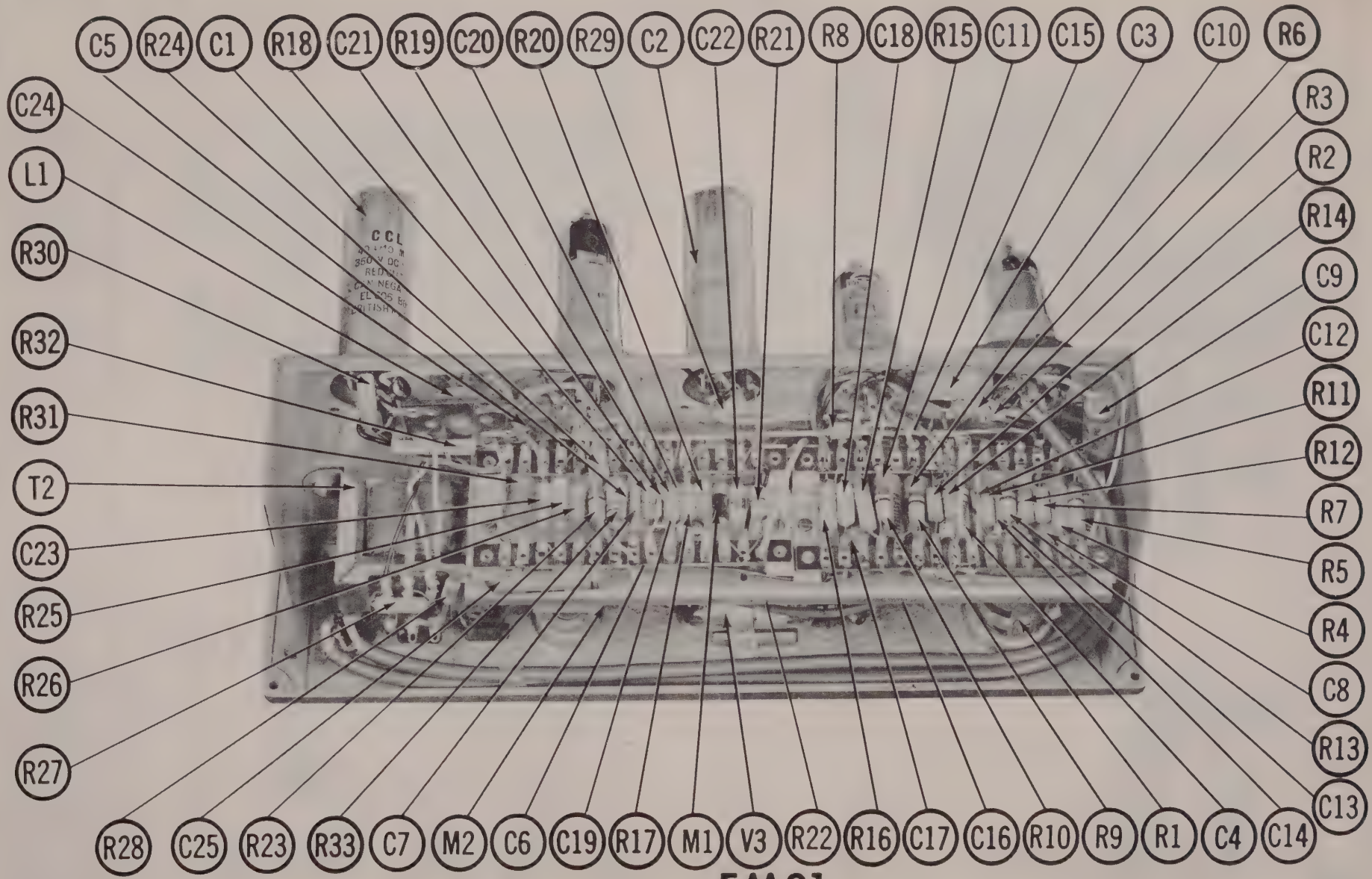
TRUVOX MODEL
TA-42 Type K

SET 471 FOLDER 20

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

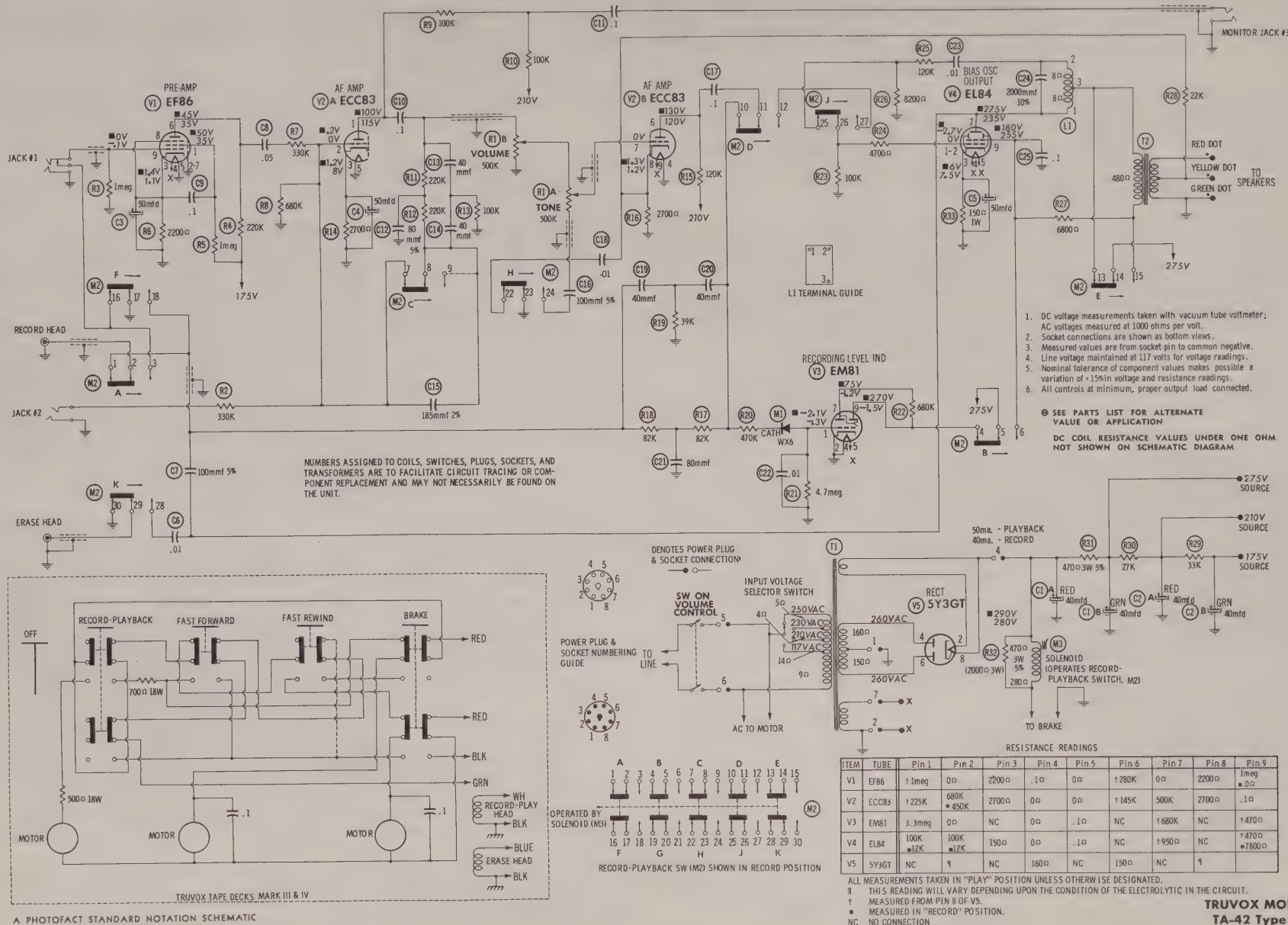
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JQ379



EM81

CHASSIS BOTTOM VIEW


PRE-AMP V1 EF86
AF AMP V2A ECC83
AF AMP V2B ECC83
BIAS OSC OUTPUT V4 EL84
RECORDING LEVEL IND V3 EM81
RECT V5 5Y3GT
MONITOR JACK #3
JACK #1
JACK #2
RECORD HEAD
ERASE HEAD
R1A TONE 500K
R1B VOLUME 500K
L1 TERMINAL GUIDE
RED DOT
YELLOW DOT
GREEN DOT
TO SPEAKERS
275V
210V
175V
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
DENOTES POWER PLUG & SOCKET CONNECTION
POWER PLUG & SOCKET NUMBERING GUIDE
INPUT VOLTAGE SELECTOR SWITCH
SW ON VOLUME CONTROL
AC TO MOTOR
50ma. - PLAYBACK
40ma. - RECORD
SOLENOID (OPERATES RECORD-PLAYBACK SWITCH, M2)
TO BRAKE
275V SOURCE
210V SOURCE
175V SOURCE
OFF
RECORD-PLAYBACK
FAST FORWARD
FAST REWIND
BRAKE
MOTOR
RECORD-PLAY HEAD
ERASE HEAD
OPERATED BY SOLENOID (M3)
RECORD-PLAYBACK SW (M2) SHOWN IN RECORD POSITION
TRUVOX TAPE DECKS MARK III & IV

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF86	†1meg	0Ω	2200Ω	.1Ω	0Ω	†280K	0Ω	2200Ω	1meg ▪0Ω
V2	ECC83	†225K	680K ▪450K	2700Ω	0Ω	0Ω	†145K	500K	2700Ω	.1Ω
V3	EM81	3.3meg	0Ω	NC	0Ω	.1Ω	NC	†680K	NC	†470Ω
V4	EL84	100K ▪12K	100K ▪12K	150Ω	0Ω	.1Ω	NC	†950Ω	NC	†470Ω ▪7800Ω
V5	5Y3GT	NC	¶	NC	160Ω	NC	150Ω	NC	¶	

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V5.
▪ MEASURED IN "RECORD" POSITION.
NC NO CONNECTION

TRUVOX MODEL TA-42 Type K

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TRUVOX MODEL
TA-42 Type K

FOLDER 20

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Preamplifier	EF86
V2	AF Amplifier	ECC83
V3	Recording Level Indicator	EM81
V4	Output - Bias Oscillator	EL84
V5	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA TRUVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	350	EL-605-B8	AFH3-181-50	BBRD4445	FP146		TVLS-2628.5*	
B	40	350				TC78			
C2A	40	350	EL-605-B8	AFH3-181-50	BBRD4445	FP146		TVLS-2628.5*	
B	40	350				TC78			
C3	50	12	CE-201	PWE25050	BBR50-25	TC29	ML50-15	TE-1133	
C4	50	12	CE-201	PWE25050	BBR50-25	TC29	ML50-15	TE-1133	
C5	50	12	CE-201	PWE25050	BBR50-25	TC29	ML50-15	TE-1133	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C7	100 5%		1469-0001	TCZ-100	22R5T1	CM-20B-101J	MCB235	MS-31
C8	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C9	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C11	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C12	80 5%		1469-000082	TCZ-82	22R5Q82	CM-20B-820J	CNO-482	MS-482
C13	40		1469-00004	TCZ-39	22R5Q4	CM-20B-390M	CNO-439	MS-44
C14	40		1469-00004	TCZ-39	22R5Q4	CM-20B-390M	CNO-439	MS-44
C15	185 2%							
C16	100 5%		1469-0001	TCZ-100	22R5T1	CM-20B-101J	MCB235	MS-31
C17	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C18	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C19	40		1469-00004	TCZ-29	22R5Q4	CM-20B-390M	CNO-439	MS-44
C20	40		1469-00004	TCZ-39	22R5Q4	CM-20B-390M	CNO-439	MS-44
C21	80		1469-000082	TCZ-82	22R5Q82	CM-20B-820M	CNO-482	MS-482
C22	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C23	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C24	2000 10%		1464-002		1R5D2	CCS-202	MCB457	MS-22
C25	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½		F1-40		■ QJ-1113R	▲ UE4045S	Tone Volume Off-On
B	500K	½		R2-41				
C	Switch			KR-2				

■ "Concentrikit" Equivalent: K-2 Kit with base elements and shafts: B11-133, P1-024 (Panel)
(Not available as a factory assembled unit) B13-133, R1-105 (Rear)
76-2 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	330K	
R3	1meg	
R4	220K	
R5	1meg	
R6	2200Ω	
R7	330K	
R8	680K	
R9	100K	
R10	100K	
R11	220K	
R12	220K	

ITEM No.	RATING	REMARKS
R13	100K	
R14	2700Ω	
R15	120K	
R16	2700Ω	
R17	82K	
R18	82K	
R19	39K	
R20	470K	
R21	4.7meg	
R22	680K	
R23	100K	

ITEM No.	RATING	REMARKS
R24	4700Ω	
R25	120K	
R26	8200Ω	
R27	6800Ω	
R28	22K	
R29	33K	
R30	27K	
R31	470Ω 5% 3W	
R32	470Ω 5% 3W	* (2000Ω 3W)
R33	150Ω 1W	

* Alternate

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA TRUVOX PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Oscillator							

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA TRUVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	250V Taps ⓐ 230V, 210V, 117V ⓐ .425A	520VCT ⓐ .050A	5V ⓐ 2A		26R36 ①	P-2872 ①		PM8405 ①	26R36 ①	R-12B ①
		SEC. 3	SEC. 4							
		6.3V ⓐ 1.9A								

① 117VAC Primary only. Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

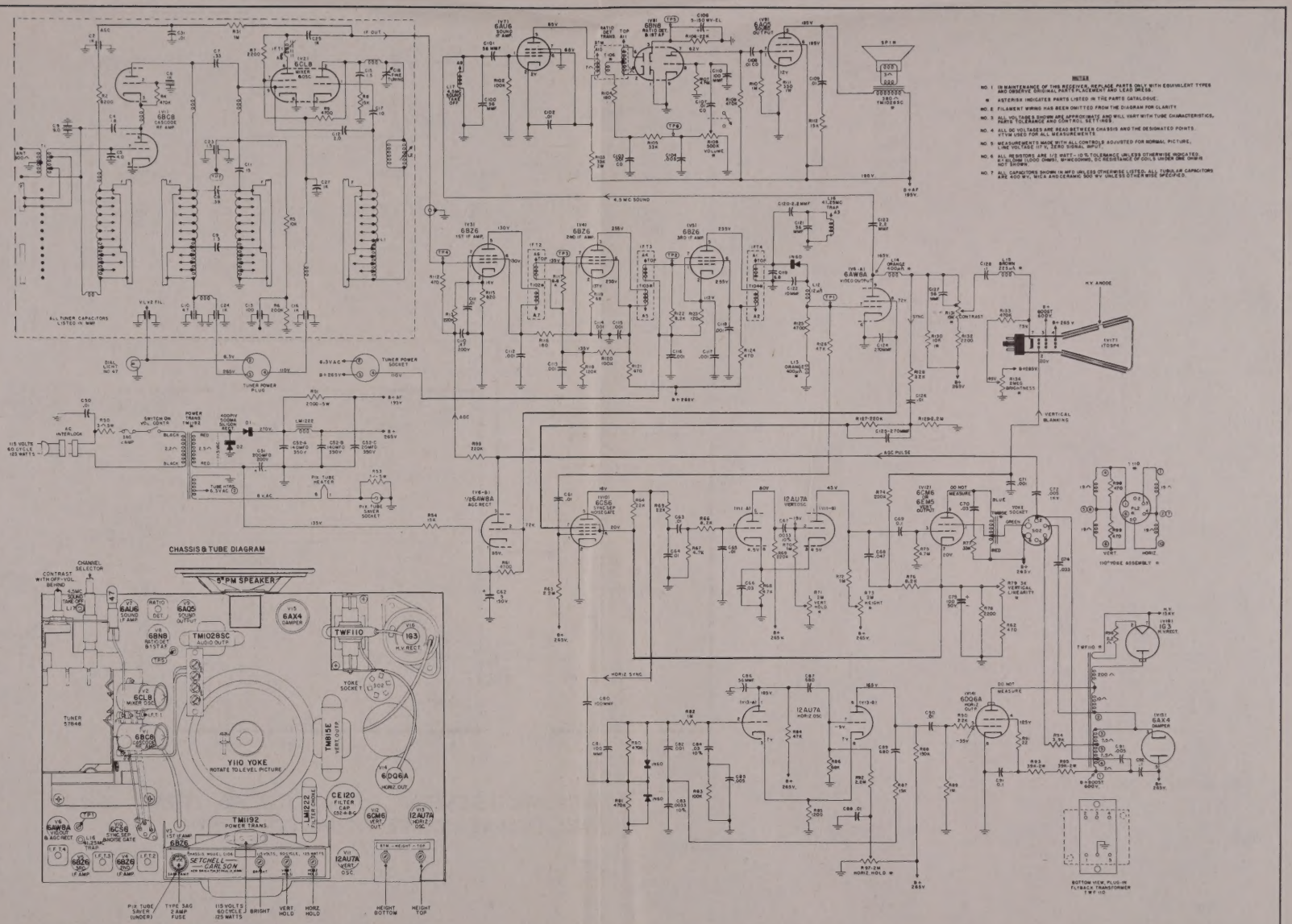
ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	5800Ω	15Ω Tap ⓐ 3Ω		24S92	A-2902 ①	AU-609	A-3870	24S92	S-55X	① Drill new mounting hole.

CRYSTAL DIODES

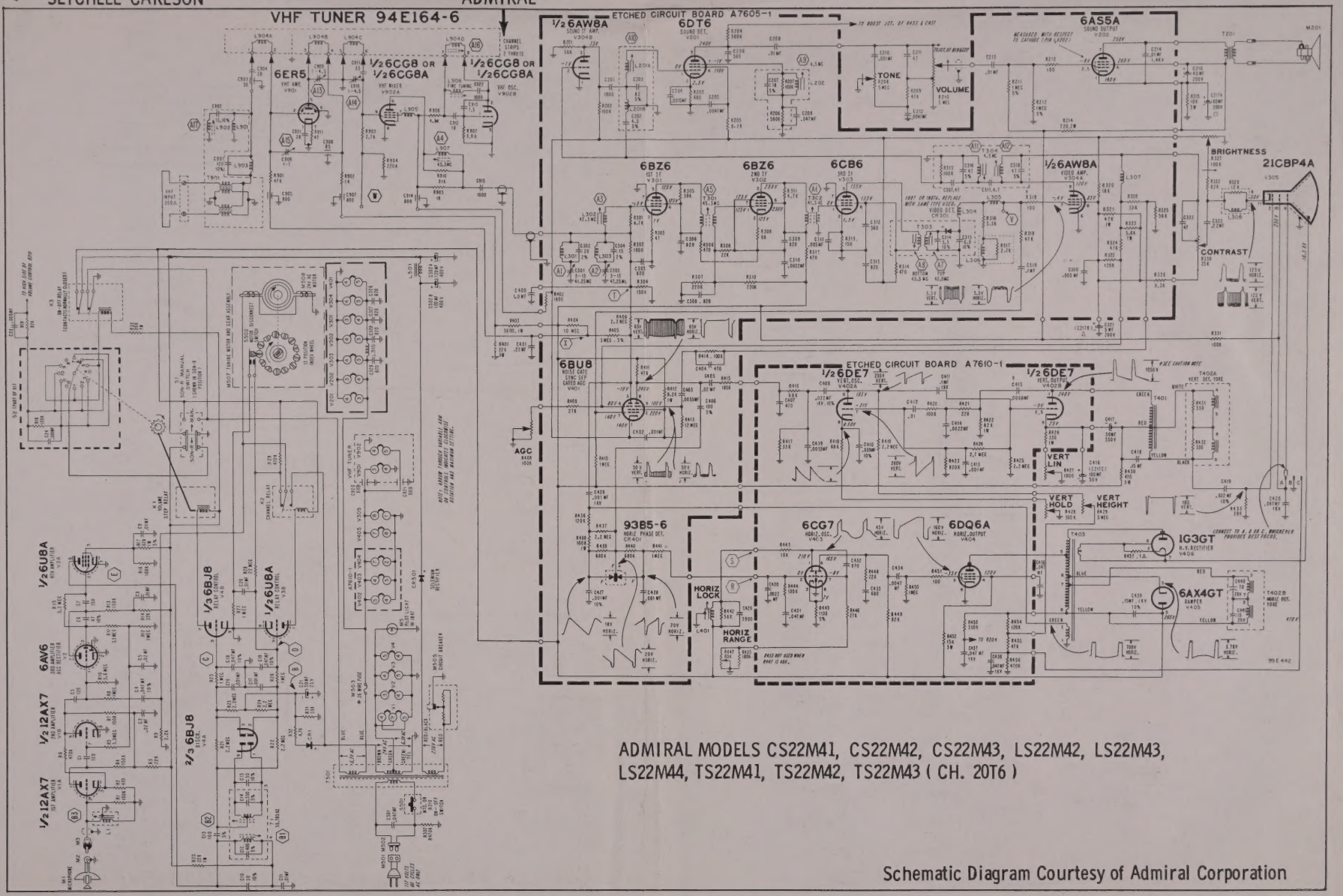
ITEM No.	ORIG. TYPE	REPLACEMENT DATA TRUVOX PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M1	WX6		1N60	1N60	1N60	Record Level Rectifier (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRUVOX PART No.	NOTES
M2	Switch		Record-Playback
M3	Solenoid		Record-Playback


CHASSIS & TUBE DIAGRAM
5" PM SPEAKER
TMI028SC
AUDIO OUTP.
TWF110
YOKE SOCKET
Y110 YOKE
ROTATE TO LEVEL PICTURE
TMI192
POWER TRANS.
CE120
FILTER CAP
TMI222
FILTER CHOKE
TMB15E
VERT. OUTP.
SETCHELL CARLSON
PIX TUBE SAVER (UNDER)
TYPE 3AG 2 AMP FUSE
115 VOLTS 60 CYCLE 125 WATTS
BRIGHT
VERT HOLD
HORZ HOLD
HEIGHT BOTTOM
HEIGHT TOP
SETCHELL-CARLSON MODEL P-66 (CH. C106)
Schematic Diagram Courtesy of Setchell-Carlson Inc.

ADMIRAL



ADMIRAL MODELS CS22M41, CS22M42, CS22M43, LS22M42, LS22M43, LS22M44, TS22M41, TS22M42, TS22M43 (CH. 20T6)

Schematic Diagram Courtesy of Admiral Corporation

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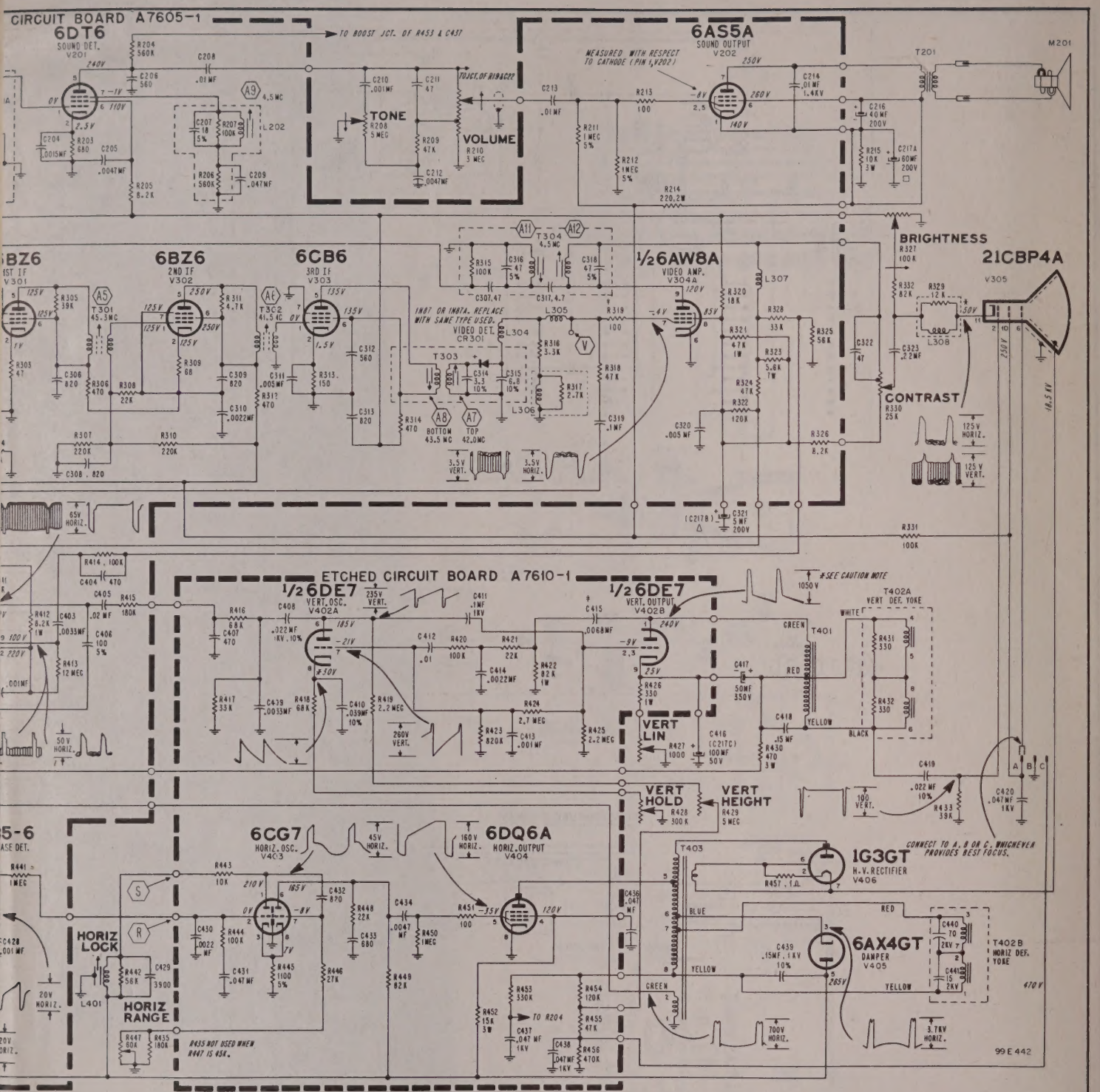

MIRAL MODELS CS22M41, CS22M42, CS22M43, LS22M42, LS22M43,
2M44, TS22M41, TS22M42, TS22M43 (CH. 20T6)

Schematic Diagram Courtesy of Admiral Corporation